PROCEEDINGS

OF THE

TWELFTH ANNUAL CONVENTION OF THE AMERICAN INSTITUTE OF ARCHITECTS,

HELD AT NEW YORK,

November 13th and 14th, 1878.

The convention met at 10 A. M., in the new building of the Delaware & Hudson Canal Co., corner of Courtlandt and Church Streets, PRESIDENT WALTER in the chair.

The first business in order was the delivery of the president's annual address.

PRESIDENT WALTER'S ADDRESS.

Fellows and Associates of the American Institute of Architects: —

These convocations mark the progress of our art, and tend to its development and advancement; their recurrence is, therefore, to be regarded as occasion for congratulation and fraternal greeting, in the interchange of which I take pleasure in meeting you to-day. We have assembled to hold our Twelfth Annual Convention, which to us, as professional architects, is an occurrence that we should highly prize, and endeavor to make the most of. The business that will come before us relates to the best interests of the profession, and it is expected that each one of us will have something to impart that will add to our general stock of knowledge; it therefore becomes us, in this connection, to "be ready for every good word and work."

We have been guarded and guided by Divine Providence since we last met in convention, and this we acknowledge with gratitude; at the same time we are called to bow with submission to a very great affliction, — our late beloved president, the venerable Richard Upjohn, has gone to his reward. He departed this life on the 17th of last August, at his picturesque home at Garrison's-on-the-Hudson. I shall not now allude to this irreparable loss, but at the request of the Board of Trustees of the Institute, I shall read a separate memorial paper on the subject to-morrow, during the morning session. We shall therefore turn for the present from the dead to the living.

The progress of architecture during the past year has been quite in sympathy with the times A period of financial depression, such as our country has passed through since our last annual convention, is by no means calculated to promote the development of architectural science. Some works of importance have been commenced, but not many; and others that were begun in better times have continued in progress of execution, with satisfactory results.

Much has been done during the year, in our large cities, in the construction of residences, and buildings for business purposes, the most of which bear the impress of independent thought in architectural composition, and it is not to be doubted that the development of the genius of design is becoming every year more apparent.

While it is true that we, as architects, recognize with satisfaction the progress of our art, it should be borne in mind that we do not expect everybody to admire what everybody else does; our tastes, fortunately, differ in regard to the æsthetic handling of most of the works that come under our notice, but that difference is the life of our art. If, in the processes of architectural design, we all thought alike, our works would be devoid of individual inspiration, and a wearisome monotony would pervade all manner of buildings. It is therefore well for our art that differences of opinion in matters of taste exist among its professors, provided the individuality that characterizes our respective works is the outgrowth of genius and cultivation.

We have, unfortunately, some specimens of building in our principal cities, which, so far from exhibiting progress in the artistic manipulation of material forms, remind us of the primitive efforts of a barbarous age, carrying us back to Ellora, Elephanta, or Uxmal; it is, however, a satisfaction to know that such eccentricities are comparatively few.

As the masses of the people become more imbued with intelligent conceptions of art, whatever fails to develop the good, the true, and the beautiful will cease to be tolerated. After all, it is to the education of the public mind in what constitutes the genius of architecture that we are to look for the suppression of crude and inartistic building, and the promotion of a taste that will do honor to the age in which we live.

But little has been done by the Institute during the past year in promoting advancement in the professional practice of our art. The general stagnation of all kinds of business has had the effect of causing a falling off of the members in their attendance at the meetings of the respective chapters, and a general loss of interest in scientific research.

If we fail to bring our minds and energies to bear upon whatever relates to the advancement of our profession, and to keep the machinery of our organization in active operation, we shall undoubtedly lose ground with the public and come short of the elevating and ennobling influences to which our art is addressed.

We shall not, however, despond. Business men say that stagnation in trade has "touched bottom," and that better times are before us. Let us then partake of the influences of the revival in business, in commercial circles, and apply ourselves, now and onward, to the promotion of all that relates to a healthy architectural progress.

In the works of the recent past a decided improvement in the structural character of buildings is noticeable. More attention than heretofore is being paid to the permanency of foundations and to the scientific elements of construction, thus affording conclusive evidence of the value of the improved architectural training which students now enjoy, and of the increased attention of architects in general to the sciences which underlie the art of building. The pursuit of knowledge in this direction, both in and out of the profession, is no doubt mainly to be attributed to the Institute and its chapters.

It is, however, to be regretted that we are not yet without occasional examples of imperfect building, some of which have resulted in serious disaster; but it should be remarked that in most, if not in every instance, the faults have been traced to unskilful superintendents and unreliable contractors, rather than to the architects from whose plans they were constructed, and who in most instances had no control over their execution.

Architects are frequently called upon to furnish designs for buildings, with detail drawings and specifications, with the understanding, implied or expressed, that in order to save a portion of the full commission of five per cent on the cost of the work, their services in the direction and execution of the design will be dispensed with; such economy is "penny wise and pound foolish," as it seldom fails to result in defects in carrying out the plans, as well as in a greater expenditure than would have been incurred had their author's design been properly executed; and what is still more, the false economy referred to has, in some cases, resulted in serious disaster.

It must, nevertheless, be borne in mind that an architect is always considered by the public as responsible for his designs, whether he is employed to see them executed or not. Should they be committed to unskilful hands and be mutilated *ad libitum*, and so imperfectly executed as to result in a want of stability, he need not expect that public opinion will exonerate him from a certain degree of blame, however perfect his design of construction may have been. Not only is the permanency of a structure affected disadvantageously by intrusting its execution to irresponsible mechanics without professional guidance, but its architectural proportions and appointments are sure to be hardly dealt with.

It would be well for the profession and well for the public if architects would decline to furnish designs, unless it were understood that they are to supervise and direct their execution.

It may not, however, be politic for an architect to insist in all cases on such an understanding, but it is obvious that the fewer drawings he commits to the manipulation of unskilled hands, the safer will be his reputation as an architect and the more satisfactory will be his practice.

As the objects which suggest themselves for the consideration of the

Institute cover everything that relates to architecture, it is eminently proper that some attention should be given to the subject of the laws which govern the erection of buildings, wherever such laws exist.

The Institute is obligated, by its relations to the building public, to inquire as to the power vested in building inspectors, particularly in our large cities; to ascertain their qualifications for the proper discharge of the duties pertaining to the office, and to inquire into the efficiency of the laws by which they are constituted and governed, and in case the public safety requires it, to recommend to the constituted authorities, especially of our large cities, such changes in existing laws and the processes of their execution as will insure greater safety to the public, and a higher degree of architectural propriety in the appearance of buildings throughout the country.

Permit me to say, in conclusion, that although our professional engagements during the past year may not have been on as extensive and magnificent a scale as we could have desired, we have all, no doubt, added more or less to the architecture of the age in which we live; and it becomes a question for us to consider whether in our works we have in any degree enhanced the dignity of our profession and the well-being of society; whether we are progressing in a purer, higher style of art; and whether the developments of our genius, as we have embodied them in material forms, have an educating effect for good on the public mind. If such is the result of our doings, we have consciousness of progress to nerve us for the future, and the satisfaction of knowing that the world is better for our having lived.

The President, at the conclusion of the address, explained that it was much shorter than he had intended, because he had originally connected with it a memorial paper on the late Mr. Upjohn, but the Committee of Arrangements had decided to defer the reading of the memorial paper till the next day.

The calling of the roll was dispensed with, a quorum having been ascertained to be present, and the Report of the Board of Trustees was read by the secretary. (*See Appendix.*) The report was accepted and laid on the table for future consideration.

The treasurer's report was next read by Mr. Hatfield (*see Appendix*), accepted, and referred to an auditing committee, which, together with the nominating committee, and other special committees, the chair was authorized and directed to appoint.

The Committee on Education was next called upon, but the secretary stated that no report had been received from them.

The Report of the Committee on Publication was read by Mr. Bloor, and accepted. (*See Appendix.*)

The reports of chapters (*see Appendix*) were next in order. Mr. Bloor read that of the New York Chapter.

The Report of the Philadelphia Chapter was not forthcoming, and the president explained that the secretary of the chapter expected to be present and read it in person. He had himself heard it read, and it contained nothing which required the action of the convention, and he proposed that if it arrived after adjournment, it should be entered upon the minutes with the others.

A motion to that effect was made and carried.

The Report of the Chicago Chapter was next called for, but none had been received.

The SECRETARY, in announcing that no report had been received from the Chicago Chapter, called the attention of the convention to Article XI., Sect. 4, of the By-Laws, which says: "The secretary of each chapter shall forward to the secretary of the Institute a memorandum of the proceedings of each meeting, such papers as may be of general interest to the profession, and an annual report at least three weeks prior to the convening of each annual convention, and upon the first of October of each year a list of all the members of the chapter."

The Report of the Cincinnati Chapter was next in order, and was read by the secretary and accepted. The Report of the Baltimore Chapter was read and laid on the table, that certain matters contained in it might be discussed subsequently.

Mr. Longfellow read the Report of the Boston Chapter, which was accepted and laid on the table.

The Report of the Rhode Island Chapter was read by Mr. Stone, accepted, and laid on the table.

The next business was the Report of the Secretary of Foreign Correspondence, Mr. Longfellow, who said that he had not been called upon to render any official services during the year except to give a note to Mr. Joseph T. Clarke, whose expedition to Greece was spoken of in the Report of the Boston Chapter.

According to the programme prepared by the Committee of Arrangements, Messrs. Cady, Robertson, and McKim, the time after the reading of reports was allotted to miscellaneous business.

MR. STONE hoped that attention would be given to the publication of the proceedings of the convention. He heartily indorsed what was said on the subject in the Report of the Baltimore Chapter, and had been himself requested to bring up the matter before the convention. If it was not possible to have a report, at least the roll of members should be printed. He hoped the convention would take action on the subject.

The secretary, MR. MCKIM, thought that Mr. Bloor, the late secretary, would be better able than himself to explain to the convention the circumstances relating to the publication of the reports.

MR. BLOOR stated that after the last convention, he had endeavored to prevail upon some one to edit the proceedings. He had asked Mr. Longfellow and Mr. Hatfield and some others, but they had all refused to undertake it. He was himself not well enough to do the work, and after trying in vain from the time of the convention until January to get some one to do it, he had given it up. He had been ill most of the time since then.

The PRESIDENT suggested that in order that the subject might be discussed, a resolution must be before the house.

MR POST asked whether the failure to publish the proceedings was owing to the inability of the secretary to procure an editor, and also whether there was not a Publication Committee connected with the Institute. Being answered that there was such a committee, he moved that a vote of censure be passed upon them for not publishing the report.

MR. BLOOR supposed the motion was intended as a joke. In addition to the reason he had given, he understood from the chairman of the Publication Committee that the financial circumstances of the Institute were not such as to warrant the publication of the proceedings.

MR. POST said that if the treasurer was unable to supply funds for printing, and the committee would state that that was the fact, he would withdraw his motion, but if they failed to do the duty of editing, which belonged to them, he should continue to press it.

The treasurer, MR. HATFIELD, stated that no application had been made to him to know if there were funds which could be applied to that purpose. An item of expense for publication, which appeared in his report, was for the report of the convention of 1876, some of the bills for which did not come in until the following year.

As the chairman of the Publication Committee was not present, Mr. Post consented to lay his motion on the table, with the privilege of calling it up on the following day.

The President then suggested that the fifth article of the programme, which called for discussion on the resolutions of the Rhode Island Chapter, in regard to the liability of architects, be taken up.

The resolutions were read, as follows: —

RESOLUTIONS OF THE RHODE ISLAND CHAPTER.

It is enacted by the ——— ——— ——— as follows: —

Whenever, from the fall or the failure of any structure, or portion thereof, to perform the duty for which it was designed, while such structure shall be in course of erection, or within five years from the completion thereof, loss of human life shall ensue, the Supreme Court of this State in term time, or the chief justice of said court in vacation, shall, within five days after such casualty, appoint a commission of three experts, viz., one member of the American Society of Civil Engineers, or officer of the Corps of Engineers of the United States Army, one Fellow or Associate of the American Institute of Architects, and one master mechanic, who shall immediately investigate the circumstances and causes of such failure; and if the report of said commission, or a majority thereof, made in writing to said court or justice, shall declare that such failure was the result of the negligence or incapacity of the person superintending the erection of such structure, or was caused by improper form of construction, or by lack of suitable or sufficient materials therein, said superintendent, or the architect, engineer, or other designer of such structure, shall be liable to a penalty of not less than $1,000, or imprisonment for not less than one or more than six years, or to both, as said court or justice shall decree; provided that no such architect, engineer, or designer shall be so held responsible for any structure, unless he shall have full control of the erection and construction thereof, nor unless the requirements of his drawings and specifications as to materials and workmanship have been in every particular fully complied with.

Every manufacturer of iron work, contractor or builder, who, by improper workmanship or the use of unsuitable materials, or of an insufficient quantity of material in any structure, shall, by the report of a commission appointed as above, be found to have caused the failure of any structure and consequent loss of human life as aforesaid, shall be liable to the penalties above prescribed, unless he shall prove that such structure conformed in all its parts, in form, dimensions, and quality of materials, to the drawings and specifications furnished therefor by the designer of said structure, or if varied therefrom, that such variation was in obedience to a written order of said designer or superintendent of construction.

Mr. Post thought the resolutions did not go far enough. They implied that every building had a superintendent or architect or designer, whereas the great majority of cases of failure occurred in buildings constructed without a designer or recognized superintendent, and he thought the responsibility of the owner, where he neglected to employ competent assistance in the design and superintendence, should be considered and incorporated in the resolutions. But his opinion was that resolutions of that character, and building laws as at present framed, were totally at variance and incompatible with each other.

He thought that the building laws went far too much into particulars. In the New York law, which was to some extent a model, all the strengths, widths, and thicknesses had been carefully considered with reference to a standard unit of building, a structure on a twenty-five foot lot, and if this standard of size were varied from, it was perfectly possible to put up a building which should be strictly in accordance with the law, and yet would fall, and such failures had occurred in the city. His own opinion was that building acts should be confined to simple provisions requiring safe distances at which timbers should be spaced, for protection from fire, and for the general construction of places of amusement and similar edifices, so that there might be speedy egress in case of fire, and also provisions in regard to the weights of certain classes of material, but all the minute directions as to the depth and thickness of arches, the thickness of walls, sizes of beams and lintels, and all questions of that kind, should be left to the architect in charge of the building, and failing that, to the builder, and finally to the owner, and that each of these in their turn should be held strictly accountable for the construction of the work which he directed. [Applause.]

The PRESIDENT called for papers on the subject covered by the resolutions.

MR. HATFIELD reminded the convention of his paper, read before their last meeting, on the use of solid floors, of wooden beams placed close together in place of iron beams, in fire-proof construction. Although not directly connected with the present subject, he would take a moment to say that since his paper was read, the objections which had then been raised, that the wood might shrink and swell, or gather moisture and rot, had been overcome by the new process of creosoting, through which it was claimed that it was preserved, not only from rot, but from swelling and shrinking also.

The PRESIDENT urged the attention of the convention to the resolutions of the Rhode Island Chapter, saying that it was desirable to obtain what information they could upon the subject, and then act upon it by fresh resolutions, or by amendment to the Rhode Island resolutions, or in any way they saw fit. He understood that Mr. Clark, of Boston, had a paper on the subject, and would call for it to be read.

MR. CLARK read his paper on the "Legal Responsibilities of Architects" (*See Appendix.*)

After the reading of the paper a vote of thanks was passed to C. F. Wingate, Esq., for his gift to the Institute of Vol. I. of the "Plumber and Sanitary Engineer," and the discussion was then resumed.

MR. MASON, by way of apology for the Rhode Island Chapter, which appeared to have presented resolutions without offering any explanations or information concerning them, said that they had been passed with the intention of bringing them before the Institute, and had been forwarded, but nothing was heard from them, and they supposed they had been laid aside, until they saw them marked on the programme for discussion, and it was then too late to do anything in the way of preparing papers.

The Secretary stated that the matter had come before the Board of Trustees, and the board had selected certain gentlemen who should be asked to prepare papers on the subject, and written requests were accordingly sent to Mr. Clark, Mr. Post, Mr. Wight, and Mr. McArthur. He should have supposed that the members of the Rhode Island Chapter would be thoroughly conversant with the subject-matter of their own resolutions, and would be prepared informally to present facts in support of them, which would be of interest.

Mr. Stone replied that the subject had been brought up at one of their chapter meetings, and after a little discussion, these resolutions were adopted, rather for the purpose of bringing the matter before the profession throughout the country, than as expressing any convictions of their own.

He could hardly say that he should personally favor the enactment of a law exactly in the words of the resolutions, but there was no doubt that some legal protection for the public was necessary. At present there was no restriction whatever to prevent any person who chose, whatever his qualifications, from putting himself forward as an architect, and the most ignorant person, calling himself by that name, enjoyed the same standing in the courts as the most competent and well trained. Under these circumstances, it seemed wise that there should be some legislation by which architects could be held more strictly responsible, but he thought that the responsibility to the public, or to an individual injured, lay first with the owner. The architect and builder were but his agents, and he thought that he should be made accountable to the public, and could himself have recourse to the architect or builder.

Mr. Mason said that Mr. Stone expressed the views of the Rhode Island Chapter. Their whole idea was to invite discussion, and get, if possible, some enactment which should help to distinguish the real architects from the apes of the profession.

Mr. Robertson could not see why architects should promote laws for the protection of the public. The public was quite able to take care of itself. Where the question was concerning the proper materials and modes of construction to be specified in a building law, that was a matter for architects to consider, but it seemed unnecessary for the profession to go out of its way to urge the public to protect itself. If architects wished to guard the profession against incompetent and unfit members, there were other and better ways of accomplishing that object.

Mr. Post thought that Mr. Robertson was in one sense right, but in another sense the legislation proposed would be very beneficial to the profession. For instance, as the New York building law now stood, an architect who was called upon to construct, with reference to some other than the twenty-five foot standard, found himself hampered by the minute and specific directions of the law to an extent which seriously increased the expense of his building, without adding to its security. As the law now stood, it was desirable that the body of architects should express their minds, whether they were disposed to do away with the specific law, and themselves assume the responsibility of their constructions, or to cling to an enforced mode of construction, which they knew to be in many cases bad, and which entailed useless expense upon their employers.

The doing away with the specific directions of the law would, in his opinion, throw upon architects the responsibility for their plans, and on builders the responsibility for their execution. It would be necessary in that case that every building should have its own plan, for which somebody would be responsible; whereas, under the existing state of affairs in this and most other States, the responsibility for all constructions rested upon the Department of Buildings and its inspectors.

Mr. Hatfield reminded the convention of an effort which had been made some seven years previously by a committee appointed either by the Institute or the New York Chapter, to secure the modification of the building law in the direction suggested by Mr. Post. The committee prepared their plan, and after some time it was accepted by the legislative committee, and printed. Some copies had been distributed, when in some mysterious way the whole edition disappeared. It turned out that a former superintendent of buildings, an influential politician, had undertaken to defeat them, and successfully for that session, as it was too late to bring the matter up again. The legislative committee wished them to try once more the next year, but they had had enough of the ways of politicians, and let the matter drop.

Mr. Fernbach criticised the manner of appointing the officials of the department, who were too often given the place as a reward for political services, instead of on account of their knowledge of their duty. The head of the department should be a man to whom both the public and the profession could look up, and should, in conjunction with others, have extensive discretionary powers in passing upon special cases.

In regard to the law proposed by the Rhode Island Chapter, he thought warning might be taken from the experience of the committee to which Mr. Hatfield had belonged, as he had just been telling. If such a draft for a law were submitted to the Legislature, it might be found that they, in their wisdom, would transform it into something very different from what was intended. He thought more could be done to raise the standard of professional ability by increased facilities for education, than by heaping up penalties for incompetency as shown by failure. Perhaps, if as Mr. Stone said, any one might come forward and ask for employment as an architect, even if he were totally ignorant of the profession, owners might be held liable for employing such persons.

Mr. Post still thought that a resolution, pointing out the nature of the responsibility of architects, might bring before the public the matter of the relation of the profession to it, and to departments and inspectors of buildings, in a way which would be of great benefit, not only to the profession, but to the building public.

Mr. Loring thought that it was high time that the incompetent persons who attached to their names the title of architect should be made to feel the weight of responsibility which attached to the proper practice of the profession. If the legal penalties for malpractice were made severe, the effect would be to make persons more cautious about assuming the name without the qualifications of an architect, and the profession and the public would be greatly benefited. He had, with others of the Chicago Chapter, tried hard to get a building law passed there after the fire, in which some allowance should be made for the possible increase of our knowledge of materials, but they found it impossible to attach anything to the law which should make it elastic, so as to provide for future needs or knowledge.

There was a very good building law in Rhode Island. He was there when it was passed, and was glad to say that it was such that the public had a legal remedy against a person who assumed the name and responsibility of architect, without understanding his business.

Mr. Robertson said that that was just the fault of the whole thing. He could not see how the standard of the profession was to be raised by heaping up penalties. If the failure of a building were made a capital offence, he did not believe that it would purify the profession much. We ought to be able to say to a young man entering the profession, "You must qualify yourself up to a certain standard, or you cannot come in," instead of, "If you put up a building and it tumbles down, you will be liable to such a penalty." Any means for raising the standard of the profession, and for making adherence to it absolutely necessary for those who become members of it, would be warmly welcomed, but to try to make better architects by legal penalties was to begin at the wrong end.

Mr. Hatfield said that Mr. Clark's paper seemed to show that the law already held architects responsible for their acts, just as much as the members of any other profession, to say nothing of the indirect penalty of loss of business and repute which would be visited on any architect, in case of the failure of a construction under his charge. The only persons who would not suffer from this indirect but severe penalty were those gypsy architects, as they might be called, who wandered from place to place, wherever there was work going on, decamping whenever employment failed them in a given locality.

Mr. Stone pointed out that the law under consideration would act as a protection to the profession as well as to the public, by placing the responsibility where it belonged. The penalty could not be enforced against the architect, unless he were proved to be responsible, and the investigation might set him right in the eyes of the public, as well as before the law. Where the owner was too niggardly to employ an architect to superintend the construction of a building, or where, as sometimes happened, he sided with the builder against the architect, a judicial inquiry would place the blame where it belonged; and if it were shown that a competent architect was prevented by the interference of the owner from carrying out plans and specifications which were sufficient and complete, or if incompetent persons had been employed to make plans, or to carry out plans properly prepared, then the responsibility would be fixed upon the owners, and their example would serve as a warning to others.

Mr. Longfellow said that judging from Mr Clark's report of the decisions in such cases, the architect moved in a kind of Donnybrook Fair, where his head was the most conspicuous, and received the most knocks. The question of the limitation of superintendence was connected with that of responsibility. If all the care of materials and workman, to the minutest details, is to be thrown from the builder upon the architect, the consequence cannot but be very demoralizing to the builder.

At least, if the architect is to be held accountable for such details, his compensation should be much larger than the one and one half per cent which is usually allowed for superintendence. If a client were to come to him and say, "I want you to put up this building and shall hold you responsible for any accident that may happen, for the quality of the workmanship and materials, from beginning to end," he would say, "I will not do it unless you are willing to pay me, not five per cent, but ten per cent." If the client should say, "I want you to employ such and such workmen, and to award the contracts to the lowest bidders," he would reply, "Then you must pay me still more."

If the architect is to be held responsible, he must have the control and the selection of the workmen, and must devote to watching every point of the work an amount of time which no one could give to more than one large building, or at most two or three small ones, at once.

He thought that such a law should discriminate between responsibility for the design of the construction, and that for the way in which it is carried out, and should also discriminate between the ordinary kind of superintendence which is usually expected of architects, and the extraordinary kind necessary where the full responsibility is to be thrown on the architect.

Mr. Post said that architects were now fully responsible for the excellence of their work, without any resolutions of chapters or institutes.

The only case in which they could possibly avoid this responsibility was in places where building acts relieved them from it. In New York, for example, every plan had to be approved by the Department of Buildings, and if approved, an inspector, appointed by the department, was employed to watch their execution, and the architect was thereby relieved from his legal responsibility, both for the excellence of the construction and of the execution of the work done under his supervision. This was why he did not wish for enactments to impose penalties on architects, but he did think it very desirable to strike out of the building laws the special provisions which took away their liberty as well as responsibility, so that the architect or the builder or the owner, as the case might be, should be held accountable for their work.

Lunch being announced, the convention adjourned till eight P. M.

WEDNESDAY, NOV. 13TH, 1878.

EVENING SESSION.

The convention was called to order by the president.

The programme for the evening called for the reading and discussion of papers. The first subject was "Plumbing and Sanitary Experiments," on which a paper was read by Mr. Clark, of Boston. (*See Appendix.*)

In the discussion which followed, Mr. Stone asked about the use of brass pipes for cold water, as mentioned in the paper just read. He had used them for hot water, but with the heavy pressure of Providence, amounting to about seventy pounds in the lower parts of the city, they would, when used for cold water, sometimes split for some distance, doing a great deal of damage. He had been at the manufactory in Boston where they were made, and was told there that they were not suitable for use under such circumstances.

Mr. Post said that in a hospital built by him a few years ago, supplied by tanks in the top of the building, he had used brass pipe throughout with perfect success.

The President called for the next subject on the programme, "The Prevailing Faults of our Architectural Designs."

Mr. Cady, for the Committee of Arrangements, read two letters on the subject which had been received by the committee in answer to requests for papers. (*See Appendix.*)

Mr. Littell then read a paper on the "Use and Abuse of Brick in Decoration."

Before discussing this paper, the president announced committees as follows: —

Auditing Committee. — Messrs. Murdock, Stone, and Bloor.

Nominating Committee. — Messrs. Stone, Longfellow, and Robertson.

Mr. Stone said, alluding to a remark in the paper just read, that owing to the smallness of the pieces of terra-cotta, it was necessary to use stone for large work; that he had had occasion to use terra-cotta in pieces large enough for window caps and lintels, sometimes six or seven feet long, and they had proved very uniform in the burning, and straight and strong. He saw no reason why burnt clay could not be used in place of stone, especially in fire-proof construction.

Clay could be selected to furnish as much variety in color as stone, and could be made of a color precisely assimilating with brick.

It seemed to him better to allow the artist to model the clay, which could be done by a skilful hand so as to produce any effect desired, from the most delicate work to the rough and bold outlines necessary for ornaments far above the eye, and let it be burnt into permanent form, than to lay up brickwork and carve it in place, with great labor and under serious difficulties from the unsuitable nature of the material.

Mr. Littell agreed with Mr. Stone that carving brickwork in place was at least a most undesirable method of treating the material, but for his part, he could not find any terra-cotta pleasing to the eye.

In the same way that in statuary the plaster of Paris cast failed of the charm given by the transparency of the marble, so terra-cotta sculpture lacked the texture and expression of strength given by stone.

Mr. Post referred to the Roman masonry, in which the burnt clay remained intact ages after the surrounding stonework had crumbled away, as evidence of the durability of terra-cotta. In regard to the criticism upon brick architecture contained in Mr. Littell's paper, that the surfaces were broken up, he questioned whether that were not due very much to the fact that the designers of cheap brick buildings were seldom men of the first rank in the profession. A good architect ought to be able to make a design in brick in which the relations of the plain and enriched parts would be as well preserved as in stone. It was our duty to try to employ the most permanent materials, and he could not see why a design in terra-cotta, well handled, might not be as effective as if executed in sandstone, and it would certainly be far more durable. It had always been with reluctance that he had consented to employ, in public works, which ought to last for ages, material which he was sure would soon begin to split off, and might not last during his own lifetime. That was the case with all, or nearly all, the sandstones in our market, in this climate.

As to the inferiority of the clay or plaster model to its reproduction in marble, he was compelled to say that his experience did not confirm the opinion of the last speaker. He had had the misfortune repeatedly to see models carefully prepared by skilful artists reproduced by workmen in the most bungling way, and he thought it an advantage to have a material which could be used directly from the hands of the artist without the interposition of careless workmen.

He did not intend to advocate the substitution of terra-cotta for stone, but thought that each material could be made effective in its proper place.

Mr. Robertson said that it could not be disputed that brickwork carved in place might produce very fine effects. There was an advantage in work carved in place, that the effect could be better understood and judged than in the case of terra-cotta, modelled and finished in a position very different from that which it was intended to occupy. About moulded brick there was a difficulty that most of us had felt, — that the sizes of the brick, and consequently the dimensions of the mouldings, were fixed. With terra-cotta any desired size could be given, which was certainly an advantage.

Mr. Loring asked how Mr. Robertson would repair a mistake, supposing that one were made in judging of or executing carving on brick.

Mr Robertson replied that of course there was a possibility of mistake, as the designer had to feel for his effect, but it was easier to judge on the spot of what the effect would be, and it was supposed that skilful workmen would be employed, who could obtain the effect wished for with tolerable certainty.

Mr. Loring thought it would be quite practicable to take the soft material to the ground and model it in place.

Mr. Robertson said this would be an advantage. He had often noticed with terra-cotta ornaments that they appeared out of scale, as if they had been stuck there, and had never been a part of the building. It would certainly be useful to be able to try the clay model in position before burning.

In answer to questions as to the process of carving upon brickwork in place, Mr. Robertson said that he understood that the bricks were laid up in cement, and the joints were managed as might best suit the design to be executed.

Mr. Post thought it important to consider whether such work would stand the effects of weather. Every one knew that the joints of projecting work would in the course of years wash out, and it was a grave question how long carving of this kind would resist our climate.

Mr. Stone inquired whether difficulty was not found in carving brickwork on account of the numerous interior cavities which were always seen when a brick was broken, and was answered that bricks were made for the purpose which were homogeneous throughout. Mr. Stone thought an objection to the use of carved brick at a considerable elevation was that the hollows could not be more than four inches in depth. In his experience, terra-cotta was capable of effects as good as he would suppose could be obtained with carved brick.

The PRESIDENT remarked, "There seems to be considerable misunderstanding in reference to carving in marble. The subject has been freely discussed, and the conclusion appears to have been arrived at, that no artists can now be obtained who are capable of producing creditable specimens of artistic sculpture in that material. This is undoubtedly a great mistake. It is only necessary to refer to the sculptured ornamentation of the new Municipal Hall of Philadelphia, to show that the workmen of the present day are fully equal to all the requirements of the profession in architectural sculpture. No difficulty in obtaining satisfactory results has ever occurred in the Philadelphia building, nor would it occur anywhere else if skilled workmen were sought out, and properly directed and encouraged.

"It is much to be regretted that an irresistible tendency seems to prevail among architects to withhold from our workmen the meed of praise and commendation to which they are justly entitled, thus missing many an opportunity to excite their emulation and promote their self-respect, both of which are elements of success in the pursuit of excellence in art.

"All men are the better for encouragement and a proper recognition of proficiency in their calling.

"Much has been said in this discussion on the possibility of producing sculptured ornaments in brickwork, and of executing architectural embellishments of any dimension in burnt clay instead of carving them in stone.

"I doubt very much the practicability of executing sculpture in brickwork with the chisel with satisfactory results, and even though it were feasible, its effects would be anything but pleasing.

"Beauty in architecture depends, in a large measure, on LIGHT and SHADE, to which the dark color of bricks would be altogether unfavorable.

"My own opinion is that artistic forms can never be successfully sculptured in brickwork.

"Bricks are now made in moulded as well as rectangular shapes, with great perfection, and are often used in the construction of ornamental brickwork with decided boldness of effect, but the application of the chisel to bricks or burnt clay, which has been advocated in this discussion, appears to me to have no promise of success.

"Marble having been referred to as being altogether inferior to brickwork, as it regards durability, I shall detain you with a few remarks on that material. It has been stated that in many ancient buildings the marble facings have entirely wasted away, while the brick backing remains intact. That is undoubtedly true, and many examples are now standing to authenticate the fact; but it should be remarked that much misapprehension exists as to the popular term *marble.* All the material so called is supposed to contain the same elements and to be substantially alike in durability, but such is not the case.

"Marble, properly speaking, is essentially a pure carbonate of lime, and as such, is not suitable for exterior building purposes; it does not afford sufficient resistance to crushing force, and it yields to the action of acids. I wish it, however, to be distinctly understood that these remarks relate exclusively to marble consisting essentially of the carbonate of lime, to which property it owes its tendency to decay.

"If we have occasion to use marble in our buildings, we have an unexceptionable material in *dolomite* or *magnesian limestone*, which has all the beauty of the carbonates of lime, and what is of equal importance, it possesses a very high degree of resistance to pressure, and is not acted upon by acids. Vast quantities of it exist throughout the United States, and it is particularly notable for the beauty of its appearance when wrought into artistic forms. Several considerable buildings in Philadelphia have been constructed of it, and it has been used more or less throughout the country; the wings of the United States Capitol are built of it, and it is now being used in the construction of the new Municipal Hall of Philadelphia.

"Of the pure carbonates of lime, we have an example in the United States Mint in Philadelphia. That building was erected of marble from Montgomery County, Pa., in 1829, by Strickland, with whom I was then a student of architecture. I made many of the drawings for it, and in my own lifetime it is going to decay.

"The columns of the portico on Chestnut Street had recently to be taken down, and granite substituted. In this building, it is true, the process of decay has been hastened by the copious discharge of gases from the large chimney-stacks.

"We need a material for building that is not affected by acids, and that resists a heavy crushing force.

"Granite and dolomite are about alike in these properties. Marble (or pure carbonate of lime) has an average resistance of 8,000 pounds to the square inch, while dolomite resists a pressure of more than 22,000 pounds. These figures are the result of more than two hundred experiments made in Washington by a commission of experts appointed for the purpose by the government.

"It should also be remarked that in all large cities the atmosphere is more or less impregnated with sulphuric-acid gas, which increases with the increasing consumption of coal; and the fact that marble, composed of the pure carbonate of lime, is injuriously affected by the gas referred to, renders it an undesirable material for exterior construction; and it is proper to say in this connection that dolomite, being an indestructible material, of greater beauty for building purposes than any now in use, is admirably adapted to sculptural decorations."

The convention then adjourned to the following day.

THURSDAY, NOV. 14TH, 1878.

MORNING SESSION.

The convention reassembled at 10 A. M.

The president announced as unfinished business the Report of the Philadelphia Chapter, which was read by the secretary. (*See Appendix.*)

The secretary then read the following letter from Mr. J. P.

Putnam, of Boston, who had, at the previous convention, been requested to prepare a paper on the resolution presented at that convention relative to the introduction of the metric system.

"Boston, Nov. 11, 1878.

"Charles F. McKim, Esq.

"*My dear Sir*,—In accordance with your request that I should write a letter in regard to the resolution of the Rhode Island Chapter on the metric system, I set out to prepare an elaborate paper on the subject, but finally concluded that half a dozen lines was all that was needed, and would be much more acceptable.

"After all, the question with us now appears to be how to *have the metric system without the trouble of getting it.* Petitions to Congress are of course useful as showing to what degree the people are interested in the matter, and what amount of co-operation may be counted on from them should the government take more decisive action. But petitions do not *educate the people*, and it is that more than anything else which is necessary. The only effect produced by our countless petitions requesting from the government further legislation on this subject has been a flat refusal (see this year's Congressional Report on the Metric System) to go further until the mass of the people are better educated in its advantages.

"Agreements on the part of professional men to use the system after certain dates fixed in advance have been signed, but they have failed on account of want of co-operation on the part of the public.

"Individuals and scientific societies have devoted an immense amount of time to agitating the subject, but their efforts have been comparatively fruitless on account of want of system. Publishers are unable or unwilling to adopt the metric system until the general public demands it, or unless the transcription from the English to the metric system be paid for by those requesting it. The publishers of the *American Architect and Building News* would undoubtedly be willing to publish their articles with metric as well as English measures, but they are unable to bear the expense of employing the necessary transcribing clerk.

"There seems to me to be but one way to bring about the desired reform quickly and smoothly, without obliging any individual or class of individuals to bear the expense alone, and that is to co-operate with the Educational Society, lately organized for that purpose. The American Metric Bureau has adopted a method of action which has proved to be successful beyond all expectation, and work done with some such system is found to be tenfold more fruitful than the same amount done by individuals acting independently. I should recommend, therefore, that those who desire to see the cause advanced energetically should examine the method of the Metric Bureau, and if it meets with their approval, that they should apply for membership. In this way they will be able to secure the aid of the society in the particular direction in which they are most interested. I send herewith a copy of the Congressional report above referred to, and a number of bulletins published by the bureau. The society will be dissolved when the metric system shall have been introduced, and whatever funds may remain in the treasury at that time, either in cash or coming from the sale of any metric apparatus in its possession, will be returned to the members.

"Very truly yours,

"JNO. PICKERING PUTNAM."

Mr. Littell remarked that in visiting the City Hall the previous day, the party had noticed a space for standard measures. There was one line for English measure, and another marked "Amsterdam measure," but the top line, which was inscribed "Federal measure," had been left blank ever since 1808, when the building was finished. Perhaps it would be a good idea for the Metric Bureau to suggest to the city government that there would be a good opportunity to introduce the measure where the people could see it.

The President called the attention of the convention to a letter from one of their members, Mr. E. Townsend Mix, of Milwaukee, who appealed to the Institute in regard to an affair of competition in which he considered himself hardly dealt with.

The letter was read by Mr. Loring, and on motion of the secretary, who feared that a general discussion of the letter would involve a debate which might take more time than could well be spared, it was referred. Mr. Post offered the following resolution: —

Resolved, That any member of this body who in case of competition shall propose or agree to undertake the work for which he is competing for a less commission or compensation than his fellows in the competition, violates the sole condition of membership in this society, viz., "The honorable practice of his profession," and that upon proof of the fact to an investigating committee, which shall consist of three Fellows, who shall be appointed by the Board of Trustees upon the demand of two Fellows of the Institute, he shall be declared to be expelled by the Board of Trustees, without further action of the Institute as a body, and that such expulsion shall expel him also from the chapter.

Mr. Post went on to say: —

"The object of the resolution is very simple. Competitions are all bad enough, but when they degenerate into competitions between architects, who will take the work at the lowest charge, affairs are in a still worse condition. To prevent this abuse I have offered this resolution. I make no reference to the ordinary charges of the profession, for the reason that there may be exceptional cases, charitable institutions or such things, where terms of competition may be offered, and accepted by certain architects, lower than those usually considered reasonable. This, although I regard it as unwise, is a matter which we cannot very well control. I do think, however, that we are in a condition, and that it is our duty, as members of the institution whose professed aim is to raise the general character of the profession, to expel from our body any man who in competition seeks to gain work, not from excellence of design, but from willingness to take the work at lower prices than his rivals."

Mr. Pfeiffer wished to offer an amendment to Mr. Post's resolution, to the effect that in case of competition limited to certain invited and paid architects, it should be considered unprofessional conduct for any other person to offer to submit plans free of cost. In one case of which he had heard, three architects had been engaged to prepare plans, at a fixed price, when a member of the New York Chapter of the Institute went to the owners with twenty-two letters of recommendation, asking the privilege of submitting plans free of cost.

Mr. Post was afraid that this amendment would hamper the original resolution, which was a very simple proposition, and Mr. Pfeiffer agreed to make it a distinct resolution. Mr. Post's motion was then put and carried.

While Mr. Pfeiffer was writing out his resolution, Mr. Post asked leave to take from the table his motion in reference to the Publication Committee, offered the previous day. In support of the motion, Mr. Post said that it appeared from the Report of the Publication Committee that the reason why the proceedings of the last convention had not been published was that no editor could be found. Now, as it was clearly the duty of the committee to find an editor and attend to the printing of this, the principal publication of the Institute, he urged the vote of censure unless there were other and better reasons for not publishing the proceedings. If there were such reasons, he would gladly withdraw his motion.

Mr. Longfellow thought the Institute ought to understand the difficulties in the way of the committee. He was, as the report showed, asked to edit the proceedings, and declined; another was asked and declined, and so on.

The question was, How should an editor be obtained? Should the convention assume the right to compel an individual to edit its proceedings? and if so, how was that individual to be selected?

For the committee, as a committee, to edit the report was impracticable. Therefore, while he should not make any resistance to a vote of censure, he would like to be informed how the work should be done, and just how much authority the Publication Committee were subject to.

Mr. Littell, as chairman of the committee, called the attention of the members to the record of the resolutions passed by the eleventh convention. There were two resolutions, one of which read that Mr. Longfellow was chosen editor by the convention, the other that thenceforth the proceedings be published in the *American Architect*. Now these resolutions were carried out, and he would like to know in what way the committee had failed to do their duty.

Mr. Longfellow explained that he had no idea that he was expected to edit the proceedings in pamphlet form. If he had, he should certainly have resigned from the committee.

Several members urging Mr. Post to withdraw his resolution in view of the circumstances, he consented to do so, proposing instead to offer a motion at the proper time in regard to the publication of the proceedings of the present convention.

On motion of Mr. Loring, the regular order of business was taken up, and the president read his Memorial Address on the late Richard Upjohn. (*See Appendix.*)

On motion of Mr. Hatfield, it was —

Resolved, That the Memorial Address, prepared and read by our president, be adopted as an expression of the sentiments of the members of the Institute regarding our late president, Mr. Richard Upjohn.

Resolved, That the Memorial be entered upon the minutes of the Institute, and a copy be furnished for the family of the deceased.

Mr. Post asked for suspension of business for a moment, to offer a resolution, that at the expiration of the election of officers, the present Library Committee be directed to report to this body the difficulties existing in printing the proceedings of this body, and a scheme for securing their publication within thirty days after the date of the adjournment of the convention. The resolution was carried.

Mr. Littell said it was impossible to do it within sixty days.

Mr. Post replied that if a great newspaper could be edited and published in one day, he could not see why their proceedings could not be published in sixty days. If lack of money was the cause, let money be raised. There was serious complaint on account of the proceedings not having been published.

Mr. Longfellow proposed that a clause should be added to Mr. Post's resolution, that the committee be authorized to employ an editor for the proceedings, at an expense not exceeding seventy-five dollars.

Mr. Post said that that was the very object of his resolution, — to call out recommendations for securing the publication effectually.

Mr. Post's original motion was then modified, by inserting, "a reasonable time," instead of specifying the number of days, and adopted.

Mr. Stone said that the treasurer's report had been audited, and found correct.

Mr. Longfellow, for the Nominating Committee, expressed their regret that Mr. McKim had felt obliged to withdraw his name as a candidate for the office of secretary. Mr. Littell also withdrew his name from the Committee on Publication.

The list as reported by the Nominating Committee was elected, the convention instructing the secretary to cast a single ballot.

The list was as follows: —

Thos. U. Walter	*President.*
R. G. Hatfield	*Treasurer.*
Charles D. Gambrill	*Secretary.*

Secretary for Foreign Correspondence.

W. P. P. Longfellow.

Publication Committee.

Geo. B. Post,
A. J. Bloor,
G. E. Harney,
H. W. Hartwell,
John Murdock.

Committee on Education.

W. R. Ware,
C. F. McKim,
Henry Van Brunt,
W. A. Potter,
J. K. Wilson.

Trustees.

C. C. Haight,
W. A. Potter,
J. C. Cady,
H. H. Richardson.

The President elect said: —

"I thank you for your kindness in re-electing me to this important and responsible office, which I feel that I am not capable of rightly filling. The president, I have always felt, should be a resident of New York. I live a hundred miles off, — out of your reach most of the time. It is therefore a greater compliment under these circumstances to have the unanimous vote of the convention, and I assure you, that whatever I can do to promote its objects shall be done. Again I thank you for this renewed expression of your kindness." [Applause.]

Miscellaneous business being now in order, Mr. Stone said that in his opinion the future of the Institute largely depended upon the publication of the proceedings in a permanent form. For the Institute to say that it had no money to pay for publication was as if a man in business should say that he could not afford to buy goods to sell again. The distant members of the Institute especially needed some tangible proof of its existence and of its power to be of benefit to them. Even a list of the members would be of some use, but they had not even that.

Mr. Longfellow, for the Library Committee, reported that the best plan they had been able to devise was for the present committee to take charge of the publication of the proceedings of the eleventh convention, leaving those of the present convention to their successors, who would come into office January first.

Mr. Post thought it would be better to issue the report of the present convention at once, without waiting for that of the eleventh convention. He had been over the treasurer's statement, and found that it was certain that there were not funds enough in the treasury for the publication. He understood that the cost of printing would be about $300, exclusive of editing, and had calculated that an extra tax of $4 on Fellows and $2 on Associates would be necessary to make up the deficiency.

Mr. Pfeiffer said that he knew from experience the impossibility of getting the matter for such a report ready in any limited space of time. The chairman of every committee thought he was entitled to the privilege of revising the report of his committee before its publication, and it would often be months before it was returned.

On one occasion the Committee on Publication had, during a convention, taken the report given in one of the city papers, which happened to be very full, and had it reprinted on slips, which they sent to all the members of the Institute. The distant members were, at the time of the meeting of the convention, anxious to hear about its proceedings After a few months their interest died away, so that some such method of distributing quickly the accounts of the more interesting portions of the discussions was very desirable.

On motion of Mr. Post, the convention voted that the assessment of $8 on Fellows and $4 on Associates be made for the purpose of supplying the funds for printing the proceedings of the last year's and the present year's conventions.

Mr. Pfeiffer's resolution, which had been laid over until after the election, was then called up, and read by the president.

Mr. Post objected to the form of the resolution, not the substance. He was in favor of something of the kind, but it was difficult to make any form which would cover all cases. He was once invited with some others to compete for a building, and it was proposed that each competitor should be paid a certain sum.

In the general interest of the profession, he had procured an alteration of the terms of the competition, by which the full commission was to be paid to the successful competitor, in consideration of the competitors all waiving the payment of the $250.

Under the pending resolution, as it stood, he would be liable to censure, whereas he had really acted for the benefit of the whole profession in obtaining for them better terms than were first offered. He therefore moved to strike out all after the word "Resolved," and substitute the following: "That if in case of paid competition any member of this Institute shall offer his services free of charge, he shall be liable to censure if charges are made by two Fellows, and a committee appointed as provided in a former resolution for censure for violation of the conditions of membership in the Institute."

Mr Robertson thought the resolution was inadequate. Every one recognized it as unprofessional for a man to offer his services free when other parties in the competition were to be paid. He would like to see the Institute go still further, and declare it unprofessional for any architect to make drawings of any kind without remuneration. There would never be remunerative competition until the members of the profession ceased to offer plans without any payment, simply for the bare possibility of securing work by so doing.

Mr. Pfeiffer thought that the offering of plans free of charge degraded the profession in the eyes of the community. Not long ago, a bank president asked him to call at the bank, where his views were asked about certain alterations, and he was asked to make sketches. He said he would do so if he were paid. But the bank president was much surprised that he should ask that. He supposed that an opportunity of advising would be considered a great favor. "I asked him," said Mr. Pfeiffer, "if he went around among counsel in an important case, and asked them to prepare briefs free of charge and submit them, so that he might choose from them, and only pay for the best. He said, "No, lawyers did not do that, but the architects almost ran him down to get such an opportunity as he had offered to me."

Mr. Post said that every question had two sides. If all the gentlemen present would agree not to make any drawings unless they got paid what they cost, he would gladly subscribe, and would keep to the agreement strictly, but he had no sympathy with men who would do $1,000 worth of work and accept $150 for it. To explain what he meant, he would refer again to his previous illustration.

A gentleman wanted him to make certain plans, and offered $250 for the plans, and two and one half per cent commission for carrying out the work, and all the plans to be the property of the party who paid the $250. Statements were made to him that other architects had accepted these terms, but he refused them. He said that if they would agree to pay him five per cent on the cost of the building and his travelling expenses, and agree besides that no idea of the plan which he designed should be used unless he were appointed architect, he would make sketches for nothing. He thought that more professional than to accept a quarter or a half of what the sketches cost him for compensation, and then claim to have been engaged in a paid competition. He was as much opposed as any one to the practice of interfering in paid competitions with offers to submit plans for nothing, but unless something were established in regard to the adequacy of the compensation, an architect might accept a few dollars for his drawings and claim to have been engaged in a paid competition. The object of presenting the substitute for Mr. Pfeiffer's resolution was that men might not be condemned unheard for a mere technical failure to comply with the terms of the resolution.

Mr. Pfeiffer thought that the substitute did not quite cover the ground. It would, for instance, not apply to a case like one in which he was once a sufferer. He was engaged in a limited competition, and went to his competitor to ask how much he proposed to charge for his services, — whether he intended to keep to the Institute schedule. He found that his rival had told the owners that his charge would be five per cent, and they parted with the understanding that both would be bound by the schedule.

After the plans had been submitted, one of the judges told him that his plans had been recommended for adoption, but the committee had felt it necessary to save all the money they could, and his competitor had made an offer to take his five per cent and pay back a portion as a donation to the institution, so as to leave his actual fees three per cent instead of five. Now the pending resolution did not cover such a case.

Mr. Post said that the committee would have to exercise their discretion, and with the change of the words "may be" to "shall be," Mr. Pfeiffer accepted the substitute resolution, which was put to the house and carried.

The report of the Committe of Ways and Means was next read by Mr. Longfellow. (*See Appendix.*)

A paper on the "Reciprocal Duties of Architects and their Employers," by Mr. Bloor, was presented, and at the suggestion of the president was considered as having been read, and referred to the Committee on Publication. (*See Appendix.*)

A letter was read as follows, and referred to the Board of Trustees, with a recommendation to consider the subject, and power to act: —

"Boston, Nov. 12, 1878.

"*My dear L.*, — If I were to be present at the approaching convention, I should like to ask the attention of the members to a clause in the schedule of charges approved by the Institute. As I shall probably not be present, may I ask you to do it for me?

"The clause I refer to is that which fixes the commission 'for stores at three per cent.' The word 'stores' is commonly understood to cover and include all classes of buildings used for the sale of goods, and perhaps also those occupied in part or in whole for offices. In this view the clause seems to me an unfortunate one, since there are many buildings included under the definition which, both without or within, require of the architect an amount of study in plan and design nearly if not quite equal to that required by a dwelling-house, public building, or church of the same cost. I think therefore that the clause ought to be modified so that it might read thus: —

"'For stores, from three to five per cent, according to the amount of design involved.'

"Or thus, 'For warehouses without interior finish, and requiring little in the way of design, three per cent.'

"I think the former is preferable.

(Signed) "CHAS. A. CUMMINGS."

On motion of Mr. Hatfield, the Committee on Publication was authorized to employ such assistance as they might need in the discharge of their duties, and votes of thanks were passed to the presiding officer and to the Committee of Arrangements, and the convention then adjourned.

REPORTS.

REPORT OF BOSTON CHAPTER.

BOSTON, NOV. 11, 1878.

To the American Institute of Architects: —

The Boston Chapter respectfully submits the following report: — During the past year eleven monthly adjourned or special meetings have been held. Perhaps the most considerable immediate result of these meetings has been the forwarding, largely through the exertions of this chapter and by its pecuniary contribution, of an enterprise having for its object an architectural investigation of the remains of the Greek Doric order in Europe. Most of the accessible literature on the subject is the result of researches prosecuted rather in the spirit of the antiquarian than of the architect; as regards the development of the essential principles of the order, concerning which architecture as a living art is most nearly concerned, but little authentic information is to be obtained, and what has been obtained and set forth in books appears to have been based upon an insufficient knowledge of the monuments of Greece and her colonies. Many Doric monuments have either never been visited at all by persons capable of making a proper use of their opportunities, or, if visited, have been but imperfectly studied.

The expedition was proposed by Mr. Joseph T. Clarke, a junior member of this chapter and a gentleman who, by education, natural energy of character, and special experience, seems exceptionally well equipped for the rendering of such valuable service to the profession and to art. After consulting with the principal archæological authorities in England and Germany, he proposes to visit the remains of the Doric temples in Sicily and Magna Græcia and the

Greek Archipelago and in Asia Minor, hoping that by the comparison of numerous examples and by the study of Doric details in various materials and constructed under various circumstances, he may be enabled to gather evidence from which a more complete knowledge of the scope and principles of the order may be obtained.

Mr. Clarke left for Europe in July, in company with Mr. F. H. Bacon, lately a graduate of the architectural department of the Massachusetts Institute of Technology, and is at this moment in consultation with the Professors of Greek Archæology in Munich, and studying in the libraries there.

On the 28th of February, the chapter, through a special committee, addressed to the Hon. Henry L. Dawes, chairman of the Senate Committee on Public Buildings and Grounds, a communication regarding the proposed completion of the Washington Monument according to the original designs. In view of the enlargement of the artistic resources of the country since the time when this design was adopted, it was urged that the execution of it now would not be in accordance with the degree of civilization which we have attained as a nation.

We therefore begged that the work might not be resumed under the patronage of government without a full understanding of the responsibilities thereby incurred, and a very careful consideration as to whether the proposed form is the best for a monument so conspicuous and representative as this must be, and whether, if the present structure is retained, it cannot be turned to some more suitable form than is now apparently intended; otherwise the government should, we thought, decline to lend its countenance to it.

The chapter has also discussed at length the question of our colonial architecture, and one or more papers on the subject, which were read by members, have been published in the *American Architect and Building News.*

A paper was also read and a discussion held on the "Growth of Conscience in the Decorative Arts of our Day."

In the course of the year the chapter has found it necessary to draw the attention of the authorities of the city of Boston to the fact that the report of the commissioners on the new system of sewerage for the city stated that one of the results of the system proposed and adopted would be to lower the level of the ground water throughout the piled land upon which a large part of the city has been erected. As such a result would leave dry the tops of much of the foundation piling, thereby threatening serious danger to the superstructures in course of time, after consultation with the commissioners, we asked the mayor and aldermen to take proper measures to ascertain the facts, before too great progress had been made upon the works. The experiments thereupon set on foot by them to test the truth of the theory of the commission have apparently developed the fact that no perceptible lowering of the ground water will be occasioned by the greater depth of the new sewers.

Among other matters of interest considered by the chapter, the question of the preservation of timber by the substitution of oil of creosote for the natural sap, according to the Hayford process, has been debated, as well as Mr. Thaddeus Hyatt's experiments in fireproof construction.

The chapter has communicated to the secretary of the Institute resolutions approving the method of levying the assessments of the Institute proposed by the Committee of Ways and Means and provisionally adopted at the convention of 1877, and recommending the said committee be made permanent, with power to fill its own vacancies.

The executive committee has now under advisement a proposition to offer the services of the society to assist in the architectural education of the junior members, draughtsmen, and students of the Architectural School, by lessons or lectures during the coming winter.

I beg leave to enclose herewith a correct list of the officers and members of the chapter.

Respectfully submitted,

HENRY VAN BRUNT, *Secretary.*

OFFICERS.

Mr. E. C. Cabot	*President.*
Mr. John H. Sturgis	*Vice-President.*
Mr. Wm. G. Preston	*Treasurer.*
Mr. Henry Van Brunt	*Secretary.*

MEMBERS.

Bradlee, Nath. J.
Brigham, Chas.
Cabot, E. C.
Chandler, F. W.
Clark, Theo. M.
Clark, H. P.
Clough, G. A.
Cummings, C. A.
Dwight, B. F.
Earle, S. C.
Esty, A. R.
Fox, John A.
Hartwell, H. W.
Lewis, W. W.
Longfellow, W. P. P.
Moore, F. H.
Paine, W. J.
Peabody, R. S.
Preston, W. G.
Sears, W. T.
Shaw, R. G.
Stearns, J. G., Jr.
Sturgis, J. H.
Stephenson, H. M.
Thayer, S. J. F.
Tilden, Geo. T.
Van Brunt, H.
Ware, W. R.
Weissbein, L.
Young, Geo. H.

ASSOCIATES.

Austin, W. D.
Clark, Joseph T.
Clymer, W. B. S.
Hammond, Geo. F.
Howe, F. M.
Kendall, H. H.
Richardson, Wm. C.
Underwood, Geo. F.

REPORT OF THE BALTIMORE CHAPTER.

Baltimore, Oct. 29, 1878.

Chas. F. McKim, Esq.,
Secretary American Institute of Architects, New York: —

Sir, — I have the honor to submit the annual report of the Baltimore Chapter, A. I. A.

Our meetings have been held regularly, and but moderately attended.

A committee was appointed early in the season to suggest some means of making the meetings more interesting, and thereby secure a better attendance.

They suggested that the social meetings be devoted to the discussion of subjects of general interest, and that all honorary and junior members and draughtsmen in the offices of practising members be invited to attend; and that the business meetings be set apart for subjects of a technical nature, as being of a more direct interest to the practising members, and for all subjects of a professional character arising during the course of the year. By this method the chapter could exert an educational influence, not only upon its own members, but through them, to a certain extent, upon the public generally.

They also suggested that members be requested to bring before the chapter drawings of works they may have in hand, and works already completed, for a free and unreserved criticism.

The report was adopted, and the committee continued to carry it into effect. Several papers of interest have been read and discussed.

The committee which has had in hand the framing of a building law for the city of Baltimore have as yet been unable to have it passed by our City Council, but renewed efforts will be made the coming year.

Some dissatisfaction has arisen at the non-issue of the annual proceedings of the American Institute of Architects.

It was always looked upon as a connecting link with the Institute. Some measures should be taken by which the chapters could hear oftener from the Institute and each other.

The annual meeting for the election of officers was held October 14.

The following were elected: —

E. C. Lind	*President.*
John Murdoch	*1st Vice-President.*
R. L. Poor	*2d Vice-President.*
John Murdoch	*Secretary.*
J. B. Noel Wyatt	*Treasurer.*
C. E. Cassell and R. Sangmeister	*Executive Committee.*

Enclosed is a list of the members.

Very respectfully,

JOHN MURDOCH,

Secretary B. C. A. I. A.

LIST OF MEMBERS OF BALTIMORE CHAPTER, A. I. A.

FELLOWS.

E. G. Lind.
John Murdoch.

ASSOCIATES.

George Archer.
E. P. Baldwin.
Henry Brauns.
C. L. Carson.
C. E. Lassell.
J. C. Gott.
J. E. Sperry.
John Wilkinson.
J. A. Wilson.
W. T. Wilson.
J. B. Noel Wyatt.

JUNIOR.

William Kirkus, Jr.

ENGINEERS.

R. L. Poor.
Jas. L. Randolph.
F. H. Smith.
Simon J. Martinet.
F. H. Hambleton.
Rudolph Sangmeister.

HONORARY.

W. H. Graham.
Alex. Russell.
John L. Lawton.
D. L. Bartlett.
E. L. Bartlett.
Hugh Sisson.
Samuel W. Register.
A. D. Emmart.
Thos. C. Basshor.
Wallace Stebbins.
John Duer.
Robert Simpson.
G. J. Dufur.
C. Y. Davidson.
Henry James.
Henry Rawlings.
Alva Hubbard.
G. H. Hunt.
R. Poole.
E. S. Young.
Emory Weatherby.

REPORT OF THE PHILADELPHIA CHAPTER.

To the American Institute of Architects: —

The undersigned, as secretary, has the honor to submit the following report from the Philadelphia Chapter for the year ending October last.

The regular meetings are held on the second and fourth Tuesdays of each month, with a summer recess of four months from June.

The meetings of the chapter, during the year, have been held with some irregularity, owing to the comparatively small number of active members, and the difficulty therefrom of obtaining a quorum; but there has been, for some time past, a healthful change in this respect, and there is encouragement to hope for a more general interest and an increased attendance in the future.

This change has been wrought partly by a system of criticism upon the works of the members of the chapter, which is not limited to favorable remark, and has been assisted in no small degree by giving the meetings a social character, which has brought the members together more intimately.

The criticism has been taken up with some enthusiasm, and has added greatly to the value and interest of the meetings.

There have been no additions to the chapter during the year.

The officers of the chapter who were elected to serve during the past year have been continued for the year to come.

The professional members of the chapter are as follows: —

Thomas M. Walter.
John M'Arthur, Jr.
Stephen D. Button.
John Stewart.
John Frazer.
Alonzo B. Jones.
Joseph M. Wilson.
Fred: G. Thom.
James P. Sims.
Theophilus P. Chandler.
James M. Windrim.
Henry Pettit.
Wm. D. Hewitt.
Wm. S. Andrews.
James C. Sidney.
T. Roney Williamson.

All of which is respectfully submitted,

T. RONEY WILLIAMSON,
Secretary, P. C. A. I. A.

REPORT OF THE CINCINNATI CHAPTER.

Cincinnati, Nov. 9, 1879.

Chas. F. McKim, Esq.,
Secretary of the American Institute of Architects: —

Dear Sir, — Herewith is the annual report of the Cincinnati Chapter, A. I. A., for the year 1877–8.

We take pleasure in reporting that good fellowship continues to abide with us in all things, and that we are striving to do all we can to advance the interests of architecture in this section of our country.

Our membership is as follows: —

Anderson, Edwin	*160 West Fourth Street.*
Bevis, Henry	*163 Central Avenue.*
Crapsey, Chas.	*68 Johnston's Building.*
McLaughlin, Jas. W.	*46 Johnston's Building.*
Nash, Albert C.	*S. W. Corner Fourth and Walnut.*
Rapp, Geo. W.	*S. E. Corner Fifth and Walnut.*
Picket, Louis	*230 Cutter Street.*
Rogers, S. W.	*64 Pike's Building.*
Wilson, Jas. K.	*88 Johnston's Building.*

The officers of the chapter are: —

Jas. W. McLaughlin	*President.*
Edwin Anderson	*Vice-President.*
George W. Rapp	*Treasurer.*
Chas. Crapsey	*Secretary.*

Respectfully submitted,

CHAS. CRAPSEY, *Secretary.*

REPORT OF THE NEW YORK CHAPTER.

New York, Nov. 12, 1878.

To the American Institute of Architects: —

The secretary of the New York Chapter respectfully submits the following report for its official year of 1877–8 and part of the year 1878–9.

Alternate business and social meetings have been called as usual, twice a month, and business has been transacted at eight of these.

At the twelfth annual meeting of the chapter, held on the 1st ultimo, the officers and standing committees of the previous year were re-elected, as shown in the list herewith appended A list of the present membership of the organization is added.

Early in the year 1877–8 a number of special committees were appointed, one being for the production of professional papers, and other means of interesting the chapter. Only two papers, however, have so far been read, both of them by Mr. Cady, one being on "Colonial Architecture in New Jersey," and the other being entitled "A Trip to the late Convention in Boston."

Another of the recently appointed special committees is the Antiquarian Committee, for the proper study and record of our colonial architecture, while it is still extant; and a third is a committee to obtain subscriptions for the "Sketch Book" of the Architectural Association in London.

Yet another special committee was appointed to ascertain the status of architects, with reference to their legal rights. The appointment of this committee arose from the fact that an architect brought to the attention of the chapter a case in which his disputed claim, decided and awarded to him in full, in a referee suit in Brooklyn, had been appealed to the higher courts, upon the special question of an architect's right of lien, and a decision rendered in the Supreme Court adverse to such right in the State of New York. The judge in his charge claimed that he could find no precedent in which the rights of an architect had been in question, but that the principle contended for had received adjudication in the case of a consulting engineer, whose claim had been set aside, on the ground that the lien law was not designed to protect professional men, but only laborers and operatives. Also, in another case, where a contractor was claimant, it was held that the contractor, who performed labor himself, with his men, did not come within the description of laborer and servant, set forth in the act. In another case, it was held that a bookkeeper did not come under that head. Consequently the judge charged that the services rendered by an architect do not come within the meaning of the term "labor."

At a recent business meeting, a communication was received from the Board of Trustees of the Institute, informing the chapter that the board had authorized the president of each chapter, as *ex officio* member of the board, to examine into the credentials and qualifications of candidates for Institute Fellowship; and also requesting chapter presidents to do all in their power to further the interests of the Institute.

Another communication from the secretary of the Institute inclosed the resolution passed at the last convention, by which the action of the financial by-laws was suspended for the year 1878, and a new method proposed for further assessments, subject to the call of a Committee on Ways and Means, provided the change should be unaimously approved by the chapters. The board accordingly requested the opinion of the New York Chapter in the premises.

A vote was taken in the chapter on the question, and the proposition involved in the resolution offered by the Institute Convention was lost.

Information having been received of the death of Richard Upjohn, on Saturday, August 17 (during the summer recess of the chapter, and when most of its members were living out of town), the Executive Committee met on the following Monday, and passed the following resolutions: —

"*Resolved*, That this committee learn with profound regret of the death, last Saturday, of our distinguished professional brother, Richard Upjohn, the architect of Trinity Church in New York, and of many other ecclesiastical and civic structures, one of the founders, and until recently the president, of the American Institute of Architects, and for many years a member of its New York Chapter.

"*Resolved*, That an advertisement be inserted by this committee in the daily papers of to-morrow, giving information to the members of the chapter, requesting them to attend the funeral, and giving the necessary information in regard to the arrangements for the same."

This was done, and at the first subsequent meeting of the chapter a committee of three, consisting of Mr. Littell, Mr. LeBrun, and the secretary of the chapter, was appointed to draught suitable resolutions on behalf of the full organization on the subject. At the last meeting of the chapter the committee presented the following resolution, which was unanimously adopted: —

"*Resolved*, That the death of Mr. Richard Upjohn has deprived the New York Chapter of an able, upright, and conscientious member, whose sterling sense and clear principles were always landmarks to his associates, while his kind-hearted counsel was as constant a comfort to them. His dignity, independence, and purity were known of all, and he gave a large charity to the weaknesses of others. He stood for years at the head of his profession, excelling in his chosen style, alike in design and execution, marking this, and cities over the whole land with grand and beautiful edifices, which are at once the pride of their neighborhoods and his own fitting monument."

As a man and as an architect, he was pre-eminent in virtues; and departing full of years, he has left behind him a noble record of good deeds in his art, as well as in his private life.

Respectfully submitted,

A. J. BLOOR, *Secretary.*

NEW YORK CHAPTER, A. I. A.

HONORARY MEMBERS.

Honorary Member in Perpetuity, having contributed $500 to the Library Fund.

H. G. Marquand	*New York.*

Honorary Members for Life, having contributed $100 to the Library Fund.

*Wm. T. Blodgett	
*I. G. Pearson	
Wm. E. Dodge, Jr.	*New York.*
H. C. Crane	*Yonkers.*
E. C. Moore	“
Henry Chauncey	*New York.*
Samuel G. Ward	“
John Jacob Astor	“
R. L. Kennedy	“
Geo. Cabot Ward	“
Ernest Tuckerman	*Paris.*
Benj. H. Field	*New York.*
A. A. Low	*Brooklyn.*
N. M. Beckwith	*New York.*
*Wm. H. Aspinwall	
Alex. Van Rensselaer	*New York.*
Jas. L. Wise	“
D. M. Barney	“
Ashbel H. Barney	“
Chas. H. Whitaker	“
*Russell Sturgis	
Russell Sturgis	*London.*
John H. Sturgis	*Boston.*
L. Marcotte	*New York.*
Sam'l B. H. Vance	“
C. T. Cook	“

* Deceased.

J. W. Pinchot	New York.
Edgar M. Smith	“
Geo. Pancoast	“

PRACTISING MEMBERS.

Babcock, J. C.	
Bloor, A. J.	128 Broadway.
Cady, J. C.	111 Broadway.
Clinton, C. W.	56 Wall Street.
Dudley, Henry	49 Wall Street.
Fernbach, Henry	348 Broadway.
Gambrill, Chas. D.	57 Broadway.
Haight, C. C.	111 Broadway.
Hardenbergh, H. J.	111 Broadway.
Harney, Geo. E.	149 Broadway.
Hatfield, O. P.	31 Pine Street.
Hatfield, R. G.	31 Pine Street.
Hathorne, Geo.	111 Broadway.
Holly, H. Hudson	111 Broadway.
Hunt, R. M.	28 East 21st Street.
Kendall, E. H.	71 Broadway.
Lederle, Jos.	196 Broadway, New York City.
Le Brun, N.	24 Park Place, “ “
Littell, Emlen T.	111 Broadway, “ “
McKim, C. F.	57 Broadway, “ “
Pfeiffer, Carl	71 Broadway, “ “
Post, Geo. B.	120 Broadway, “ “
Potter, Wm. A.	Supervising Architect, Treasury Dept., Washington, D. C.
Renwick, James	4 Broad Street, New York City.
Robertson, R. H.	54 William Street, “ “
Sands, Joseph	4 Broad Street, “ “
Upjohn, R. M.	111 Broadway, “ “

JUNIOR MEMBERS.

Brown, B. H.	Office of Wheeler Smith, 1 Union Square.
Bush, Howard S.	Office of R. H. Robertson, 54 William Street, N. Y. City.
Buckley, Rich'd W.	Office of Buckley & Smith, 229 Broadway, N. Y. C.
Cogswell, C. F.	Office of Thos. Fuller, 45 North Pearl Street, Albany, N. Y.
Ficken, H. E.	57 Broadway.
Friend, John	Office of Carl Pfeiffer, 113 Broadway, New York City.
Gilvary, P. H.	Care Hardenbergh.

Gray, Wm. B.	*Office of Supervising Architect, Treas. Dept., Washington, D. C.*
Kemp, Edward M.	*128 Broadway, Room 11, New York City.*
Mead, Theo.	*Office of R. H. Robertson, 54 William Street, N. Y. City.*
Merritt, W. J.	*Office of R. G. Hatfield, 31 Pine St., New York City.*
Norton, Frank H.	*Office of R. H. Robertson, 54 William Street, N. Y. City.*
Robinson, L. W.	*Office of Supervising Architect, Treas. Dept., Washington, D. C.*
Smythe, Douglas	*111 Broadway, New York City.*
Whitley, J. E	*Office of " The World."*
Williamson, D. D.	*New Brunswick, N. J.*

OFFICERS AND STANDING COMMITTEES ELECTED FOR THE OFFICIAL YEAR OF 1878-79.

R. G. Hatfield	*President.*
Emlen T. Littell	*1st Vice-President.*
Geo. B. Post	*2d Vice-President.*
Henry Fernbach	*Treasurer.*
A. J. Bloor	*Secretary and Librarian.*

Executive Committee.

R. G. Hatfield,
A. J. Bloor,
Henry Fernbach,
N. LeBrun,
R. M. Upjohn.

Committee on Admissions.

R. H. Robertson,
E. T. Littell,
R. M. Hunt,
H. J. Hardenbergh,
R. G. Hatfield.

Committee on Library and Publications.

R. M. Hunt,
C. C. Haight,
A J. Bloor,
Geo. E. Harney,
R. G. Hatfield.

Committee on Education.

Wm. A. Potter,
R. M. Hunt,
Carl Pfeiffer,
C. F. McKim,
R. G. Hatfield.

Committee on Examinations.

Henry Dudley,
R. M. Upjohn,
N. LeBrun,
R. M. Hunt,
R. G. Hatfield.

REPORT OF RHODE ISLAND CHAPTER.

PROVIDENCE, October 24, 1878.

The Rhode Island Chapter respectfully submits its third annual report.

During the past year ten meetings have been held, of which two were in Newport, the others in Providence. At these meetings numerous topics of local interest have been discussed, and at the Newport meetings, the time was very pleasantly and profitably occupied in the inspection and criticism of buildings just completed or in course of erection.

Two papers have been read, both illustrated, — one by Mr. Loring, of Chicago, on the "Architectural Uses of Terra-Cotta," the other by Mr. Nisbitt, junior member of our chapter, on "The British Surveyor and his Methods of taking out Quantities." We have also received and discussed several interesting letters from one of our members now in Europe.

The earlier part of the year was spent by the chapter in urging through the Legislature of the State the building law for the city of Providence, on which very much labor had been expended and which had received the nearly unanimous indorsement of the city government. We regret to be compelled to state that our efforts were only partially successful, being foiled by a very determined opposition on the part of some builders and owners of real estate, so that although a law was passed containing a majority of the provisions we had embodied, and capable of doing good service, if thoroughly enforced, yet many of the most important sections were stricken out, and the means of enforcement were rendered entirely inadequate. Indeed, it would seem that obscurity of language and indefinite provisions are preferred by the public, who suffer the consequences of them, to clearness of statement and explicitness of detail; brevity, however obscure, to fulness of necessary explanation.

We hope, before long, to induce supplementary legislation to restore the omitted portions, and we trust that those of you who have seen the law as it now stands, will not hold our chapter responsible for its shortcomings, or want of executive apparatus.

As the several matters to which this chapter ventured to call the attention of the last convention, and which were referred to the Board of Trustees, are still before them, we ought not to anticipate any report from them, further than to express our continued desire that some measures should be taken to, at least, bring these subjects into discussion. We refer to the proposed preparation of an authoritative treatise on the local building materials of the United States; the definition, by national legal enactment, of the responsibility of architects and engineers for defects of construction, securing to the profession a sufficient authority over works in progress; and the promotion of the introduction of the metric system by providing means of comparison between metric and common measures, by adding metric scales on all charts, maps, and architectural, engineering, and other scientific publications intended to be of permanent value.

In common with all our associates, the Rhode Island Chapter mourns the loss of the late president of the Institute, Mr. Richard Upjohn.

His career has been known and watched from the beginning by several of our number, and is at once a guide and incentive to excellence and honor in our profession. Leaving in our cities of Providence and Newport many monuments of his professional skill, including two churches, the Children's Home, and numerous dwellings, he has been brought peculiarly near to our sympathies; and we cannot close our report without expressing our sense of the worth of his influence to the past and future of the honorable practice of our profession.

During the year the chapter has received one member, and now comprises ten professional and one junior member. At the annual meeting, held Oct. 2d, the interest seemed to be unabated, and to give promise of an active and profitable winter session, and we therefore enter the new year in sound financial condition, and hopeful of progress.

Respectfully submitted,

CHAS. P. HARTSHORN,

Secretary.

MEMBERS OF RHODE ISLAND CHAPTER, OCT. 1, 1878.

PROFESSIONAL.

ALPHEUS C. MORSE	*42 Weybosset Street, Providence.*
ALFRED STONE	*65 Westminster Street,* "
CHAS. P. HARTSHORN	*45 Westminster Street,* "
EDWARD I. NICKERSON	*45 Westminster Street,* "
CHAS. E. CARPENTER	*65 Westminster Street,* "
GEO. C. MASON, JR.	*Newport.*
GEO. W. CADY	*164 Westminster Street, Providence.*
*EDWIN L. HOWLAND	
DUDLEY NEWTON	*Newport.*
JAMES MURPHY	*54 North Main Street, Providence.*
JAMES FLUDDER	*Newport.*

JUNIOR MEMBER.

HENRY A. NISBITT	*Providence.*

OFFICERS ELECTED AT ANNUAL MEETING, OCT. 2, 1878.

President	A. C. MORSE, *Providence.*
Vice-President	A. STONE, *Providence.*
Treasurer	GEO. C. MASON, JR., *Newport.*
Secretary	CHAS. P. HARTSHORN, *Providence.*

Executive Committee.

GEO. W. CADY	*Providence.*
JAS. FLUDDER	*Newport.*

Committee on Admissions.

C. E. CARPENTER	*Providence.*
JAS. MURPHY	"
DUDLEY NEWTON	*Newport.*

REPORT OF ALBANY CHAPTER.

ALBANY, Oct. 28, 1878.

Dear Sir, — Pardon delay in writing. I have just received postal card. The Albany Chapter has had no meeting since last report. Our president, Mr. Fuller, has removed from Albany, hence no meeting has been called.

Yours respectfully,
CHARLES C. NICHOLS,
Secretary Albany Chapter, A. I. A.

P. S. Efforts are being made to form a new board.

TREASURER'S REPORT.

R. G. Hatfield, *Treasurer, in account with the* American Institute of Architects.

Dr.

1877.				
Oct. 1.	Balance from last report		$166 36	
12.	Cash from New York Chapter, rent due August 1st		62 50	
Nov. 2.	Cash from New York Chapter, rent due November 1st		62 50	
1878.				
Feb. 8.	Cash from New York Chapter, rent due February 1st		62 50	
May 11.	Cash from New York Chapter, rent due May 1st		62 50	
	Cash during year from sales of publications, see vouchers (d. $2.30) (l. $1.40) (t. $1.00) (y. $0.41) (ag. $1.08) (ah. $1.20) (ai. $0.60) (aj. $0.30) and (ak. $3.20)		11 49	
	Cash during during year from initiations	$30 00		
	Cash during year from contributions, February, 1876	15 00		
	Cash during year from contributions, October, 1876	25 00		
	Cash during year from contributions, February, 1877	165 00		
	Cash during year from contributions, October, 1877	678 85		
	Cash during year from contributions, February, 1878	521 20		
	Cash during year from contributions, October, 1878	7 50		
	Total initiation fees and contributions		$1,442 55	
	Total receipts			$1,870 40

TREASURER'S REPORT.

R. G. Hatfield, *Treasurer, in account with the* American Institute of Architects.

Cr.

	Cash paid Secretary's clerical services	$394 02		
	Cash paid Secretary's printing and stationery	36 82		
	Cash paid Secretary's postage	32 45		
	Cash paid Secretary's express, telegrams, and sundries	11 50		
	Total Secretary's expenses	———	$474 79	
	Cash paid Treasurer's clerical services	$173 48		
	Cash paid Treasurer's printing and stationery	10 00		
	Postage	9 72		
	Total Treasurer's expenses	———	193 20	
	Cash paid convention clerical services	$83 93		
	Cash paid convention printing and stationery	25 73		
	Cash paid convention travel	46 44		
	Total convention expenses	———	156 10	
	Cash paid reporting proceedings, 1877	80 00		
	Cash paid editing proceedings, 1876	50 00		
	Cash paid printing proceedings, 1876	305 00		
	Total expenses Committee on Publication	———	435 00	
	Cash paid furniture and repairs	50 60		
	“ rent	400 00		
	“ janitor, fuel, gas, and sundries	88 93		
	Total room expenses	———	539 53	
	Cash paid expenses special committee		3 00	
1878.				
Oct. 1.	Balance to next report		68 78	
	Total disbursements		———	$1,870 40

REPORT OF THE COMMITTEE OF WAYS AND MEANS.

To the American Institute of Architects:—

The resolution passed by the Eleventh Annual Convention of the Institute, in virtue of which your committee was appointed, directed them to present to that convention an estimate of the probable expenses of the year 1878, and, after assigning to these expenses the amount of money to be raised by the direct tax upon Fellows and Associates at large, as set forth in the resolution, to adjust the assessments to be levied upon the chapters according to their membership, in place of the direct fees, remitted by the resolution, as should be needed to make up the balance of the expenses.

Your committee accordingly reported to the convention an estimate of the expenses of the current year, of the amount of money which would be furnished by the diminished assessments, and the amount which it would be necessary to raise by tax upon the chapters, together with an adjustment of the tax for the several chapters, according to their membership. The levy thus made was to take effect only in case the resolution should be accepted by the votes of the chapters to which it was to be referred.

To communicate the resolution to the chapters, and to procure their action upon it, occupied some time, and their action was not made known in season to allow the revenue of this year to be collected as proposed in the resolution. The old method of collection, therefore, remained in force for this year, and the resolution having in the mean time been rejected by the chapters, the experiment proposed by the Committee of Inspection and Advice is yet untried.

The other subject proposed by the resolution was the best means of increasing the membership of the Institute, and here your committee find themselves upon difficult ground. The attractiveness of membership in any society depends chiefly on two things, — the distinction of the members, and the work accomplished by the society.

It has been the policy of the Institute, as it has been that of all the professional societies that we know of, to ignore the first of these attractions, offering membership to all architects of reasonable capability, whose professional practice was honorable, and relying solely on the second. While it might not be practicable or even desirable to attempt any radical change in this policy, which nevertheless has certainly not led to that growth of the Institute which its members have desired, and while your committee are not prepared with any recommendations looking in that direction, it may still be well to bear in mind, what is undoubtedly true, that if the hundred and fifty members of the Institute were all recognized as men of exceptional qualifications, the rest of the profession would be glad to be added to them. If even it could be understood by the public that membership of the Institute was a guaranty for a thorough qualification in the parts of a professional training which are most essential, or if the association could provide any means of furnishing such a guaranty to proper persons, in a way that would command recognition, our influence and prestige would probably be a good deal increased, and the means of advancing our membership would doubtless be in our hands.

Any guaranty of artistic excellence is in the nature of things impossible; natural selection is the only resort here, where the architect's highest qualification is concerned.

But another qualification, in which the public are even more interested, and which recent experience has made them look for with especial concern, his knowledge of materials and construction, is fairly subject to a guaranty.

Without intruding upon the question of the qualifying of architects, which was, by the vote of the last convention, referred to the Committee on Education, your committee may remind the Institute that the establishment of a technical examination for architects is one of its traditional objects and may commend it anew to your consideration. Such examinations may be either purely voluntary, as in England, or an absolute qualification for certain privileges, as in some continental countries. They would naturally appeal chiefly to the younger members of the profession, to whom we look mainly for our future membership, and among whom it would be to our advantage to find some means of selecting, as well as attracting the more promising. There is reason to believe that there are some among them at least to whom the opportunity of proving their qualifications by an accredited examination would be welcome.

As to the interest of the work accomplished to the society, the committee would suggest that here the question of opportuneness may often with advantage take precedence of that of abstract importance, and that it would be an advantage if it were made the special duty of some officer, either one of the present officers, or one especially appointed for the purpose, to study the opportunities of the Institute, to consider what questions are, from time to time, prominently before our profession or the persons with whom it is concerned, and how they may be brought before it for action and discussion; to find what appropriate subjects have been made matter of special study; to discover and appeal to the men, whether inside the profession or outside, who have something of value to say to us or are ready to work with us.

In the management of the conventions, your committee would suggest that an improvement might be made by taking pains to secure papers from persons who were acknowledged masters of special subjects, irrespective of membership, by announcing the subjects long beforehand, so that there might be opportunity for preparation of discussions, and by taking care that proper time was allowed for them without conflict with the routine business of the conventions. They would renew the suggestion which has been made, they believe, by a previous committee, that at each convention there should be read at least one important paper, carefully prepared by some one whose authority will command general respect and interest, on a subject of technological bearing, constructive or mechanical, and one on some æsthetic or historical topic. They may instance as one appropriate topic the whole subject of American archæology, the study of which has, so far as they know, been left entirely to non-professional persons. The efforts that have been made at the last two conventions to procure papers and discussions on matters more or less æsthetic have, they think, added visibly to the interest of the meetings and illustrate the value of attention given to the more cultivated side of our profession, a side which, in the activity of our business discussions, we are, perhaps, too apt to overlook. We may here, the committee think, profitably take heed of the example of our English fellow-societies, whose published proceedings are made valuable by careful and scholarly essays on special points in the history of architecture and the arts, or studies of their processes, subjects which are of permanent interest to us all, but for which our active lives leave us little time, and which are not presented to us by the books in a form to be attractive to busy men.

One of the main responsibilities of the Institute is its influence upon the young men of the profession, and with this its future success is intimately connected, since it is to them, as your committee have just reminded you, that we are to look for our future membership.

We are not likely to overrate the advantage to the Institute of leading the best of the coming men to identify their interests with it, in the early enthusiasm of their professional career. Nothing so much promotes a common interest as co-operation in work, and we shall therefore gain at once, in the discharge of our own duties. and in the increase of our influence and future opportunities, if we can find means of enlisting these younger men in some effective work. There are many subjects of study, more or less neglected, which the young men have time to work out, and which are not beyond their powers, if their effort is not too much diffused ; many problems to be studied and records of current experience to be gathered up for which they have time, and the older men have not ; much unsifted material which a reasonable amount of well-directed work from them could put into a shape which would make it valuable for ordinary use. We may mention on the practical side the collection of information from various current sources concerning new materials which are coming into use. On the scholarly side there is a good illustration in the expedition of Mr. Clarke, for the study of Doric architecture, mentioned in the report of the Boston Chapter for this year, and many more modest but useful suggestions can easily be found.

If it were understood that the Institute gave a hearty encouragement to promising efforts in these fields, many opportunities for offering such encouragement would doubtless soon appear. And here your committee would remind the Institute of the excellent suggestions contained in the report of the Committee on Education to the last convention.

Among the means that naturally suggest themselves for offering encouragement to our juniors, besides the examination already suggested, is the giving of a prize or prizes, either for excellence in design or for investigation of special questions of professional interest. A project which has been a traditional aspiration of the Institute, the establishment of scholarships, resident or travelling, will, when it becomes practicable, be a means of great usefulness. With the present slender income of the society and the pressure of economy which is now felt, the committee do not feel warranted in recommending any specific action which would increase our expenditures; but they seriously commend these suggestions to the attention of the Institute.

Respectfully submitted,

H. H. RICHARDSON.
ALFRED STONE.
W. P. P. LONGFELLOW, *Chairman.*

REPORT OF THE COMMITTEE ON PUBLICATIONS.

Nov. 12, 1878.

To the Twelfth Annual Convention of the American Institute of Architects:—

The Committee on Publications respectfully reports: —

That the committee held meetings at intervals during the past Institute year, the business considered, the publication of the proceedings of the last annual convention.

Your committee urgently requested Mr. Longfellow to edit the proceedings, as would seem to have been primarily contemplated by the resolutions of the last convention, but owing to press of private business, he could not be induced to do so.

Your committee, after vainly asking for the editorial services of several members of the Institute, then determined to edit the proceedings within itself and so publish them, and the necessary arrangements for so doing were in progress when a communication from the secretary of the Institute considered the arrangement with Mr. Longfellow to be the only one within the scope of the aforesaid resolutions.

Your committee therefore abandoned its intention so as to allow the whole matter to be definitely ordered by the present convention.

E. T. LITTELL.
GEO. E. HARNEY.
H. W. HARTWELL.
A. J. BLOOR.
W. P. P. LONGFELLOW.

REPORT OF THE BOARD OF TRUSTEES.

To the American Institute of Architects: —

1. Your Board of Trustees have respectfully to report that since the last convention they have held (9) nine meetings, (3) three quarterly and (6) six monthly, it having been found impossible to collect a quorum during the summer months.

2. There have been but few applicants for membership during the past year, due perhaps to the very general business stagnation throughout the country.

3. The resignation of Mr. Bloor having necessitated a change in the offices of the Institute, a room has been secured connecting with the office of the present secretary, at No. 57 Broadway, New York, suitably furnished and fitted up, and at a reduced rent from that paid by the Institute during previous years.

4. In the matter of the various resolutions passed at last convention and referred to your Board of Trustees, action has been taken as follows: —

The resolution in the matter of "honorary members deriving emolument from the practice of architecture," etc., etc., was duly recorded in the minutes of the Institute.

The resolution in the matter of "a Special Committee of Ways and Means," etc., etc., being acted upon by your board, was rejected by chapters.

The resolution in the matter of "organizing Committees of Examination to act with local building authorities," etc., etc., being brought up, chapters were requested to act on the recommendation of the convention.

The resolution in the matter of "inducing Congress to authorize the War Department to make practical tests of all so-called 'fireproof materials,'" etc., etc., being brought up by board, was tabled, it having been found impossible to attain any end by correspondence; a promise, however, from President Walter to report after a personal interview with certain Washington authorities, will be looked for with interest.

Mr. Ware's motion in the matter of those already elected members of chapters, etc., being brought up, the following resolution was carried: "That the board is of the opinion that it would not be to the interests of the Institute to change the manner of election."

In the matter of the resolutions contained in the report of the Rhode Island Chapter at last convention and also referred to the board of Trustees, the board has not considered it expedient to act without further advice from convention, and has therefore requested papers upon the subjects therein treated from various prominent members of the Institute, to be read at this convention.

In the matter of candidates for fellowship in the Institute, your board would report the following action: —

At a meeting held Friday, May 10, 1878, it was

First Resolved, "That the president of each chapter of the Institute (being a member of the Board of Trustees) be hereby appointed a committee to examine the credentials and qualifications of candidates for fellowship to the Institute."

Second Resolved, "That after such examination said president of chapter shall forward to the Board of Trustees the application of such candidates as he may approve, with his indorsement."

Third Resolved, "That in carrying out the above resolves the president of each chapter be requested to do all in his power towards furthering the interests of the Institute."

The secretary thereupon advised each chapter of this action of the board.

Your board would further report that of the applicants for fellowship, during the past year, but two have as yet been elected; one name has been added to the roll of Associates; also must be mentioned the loss of one gentleman from our roll of Fellows.

We now number (65) sixty-five Fellows and (72) seventy-two Associates.

In closing this report, your board feels it most fit to record the loss sustained by the profession and the country generally in the recent death of Richard Upjohn, one of the most conscientious, able, and respected men of the day.

Respectfully submitted.

Nov. 13, 1878.

APPENDIX.

PRESIDENT WALTER'S ADDRESS.

Fellows and Associates: —

We convene to-day for the purpose of holding the Eleventh Annual Convention of the American Institute of Architects.

Through the goodness of Divine Providence, which it becomes us to recognize with gratitude, we come together with the added experience of another year, to transact the current business of the Institute, and to consider such questions as may come before us, having a bearing on the interests of the profession, and the general diffusion of sound views and proper conceptions relating to the science and practice of our art.

We have the privilege of meeting, on this occasion, in the metropolitan city of New England, — a city distinguished alike for progress in the arts of civilization, and for the culture, refinement, and commercial enterprise of its people. We held our Fifth Convention in this city, and we here begin to-day the second decade of these annual reunions. We are glad to meet again with our Boston friends; and I sincerely hope that our convocation may prove successful in promoting the progress of architectural science, the well-being and efficiency of the Institute, and the general interests of the profession.

During the past year, opportunities for architectural development have been very much curtailed by the business depression which has so long rested upon our country, and, indeed, upon all centres of civilization throughout the world. It is nevertheless true that the profession of architecture has never presented so encouraging an aspect as it does to-day. Wherever buildings of importance have been erected, an independence of thought has been manifested in details, as well as in the grouping of leading features, that more than indicates the processes of intelligent study.

An innate feeling of irresistible progress seems to have pervaded all our commercial centres, developing itself in palatial structures possessing far more artistic elegance than the more pretentious buildings erected in the recent past.

In various sections of the country, extensive edifices, both public and private, including several churches of magnificent proportions and costly finish, are now in progress of construction, thus characterizing the present era as one of decided progress. In our principal business thoroughfares we find rich, effective, and novel styles of building, adapted to every conceivable species of enterprise; while on every hand we observe unmistakable evidence of progress in the arts of design and in the sciences which relate to construction.

These remarks must not, however, be understood to imply a wholesale approval of all that has been done under the name of architecture: by no means. While we find much to admire, we find more to condemn. We cannot, however, fail to observe that the proportion of unscientific building throughout the country is growing less every year; hence it becomes an important question for the Institute to consider, how a better taste in design, and more substantial methods of construction, may still further be promoted, even in the plainest and most inconsiderable structures.

It is a great mistake to suppose that taste and solidity are necessarily expensive properties in building. The materials required for a small house, or a large one, may be so disposed as to produce pleasing effects, and at the same time give strength and permanency to the structure, without enhancing the cost, or interfering with the uses for which it is designed; and we all know that in more elaborate buildings taste and skill are far less expensive than ignorance and incapacity.

During the past decade architecture has taken a wide departure from the processes of thought that formerly held in check the spirit of inspiration in design; and the season which has just closed may be considered as having been more productive of originality in the conception of architectural forms, than any previous period of the world's history.

It is not necessary for me, on the present occasion, to allude specifically to the works which have been executed during the past year, as the most of the considerable buildings now in process of construction were commenced previous to our last convention, and were at that time graphically described in the opening address of Mr. A. J. Bloor, — an address which brings up our art through the mutations of a hundred years with historic accuracy, and which does full justice to the great centennial anniversary of our national independence.

In view of this valuable contribution to architectural history throughout the century, I deem it proper not to detain you with any descriptive account of the works now in progress, but rather to look at our art in the light in which we find it to-day.

Architecture as now practised has evidently ceased to be confined to certain schools, founded upon principles of law and order, evolved from the fragmentary remains of nationalities which have long since passed out of existence. The advancement of the physical sciences, and the development of the æsthetic nature in man, have wrought astounding changes in the processes of architectural thought, — changes which admonish us not to go to the other extreme, but rather to guard against becoming too eclectic in our practice, and letting extravagant freaks of fancy carry us, in our conceptions of material forms, beyond "the eternal fitness of things" and the irrevocable principles of beauty, — principles which can never be violated without producing effects always to be deprecated.

From a retrospect of the past, it is evident that under all circumstances — in war and in peace, in prosperity and in adversity — the progress of the American mind in the arts of civilization is not only constant, but cumulative. It is worthy of note in this connection, that while the savagery of our recent internecine war was ravaging the country with unsparing hand, dealing death and destruction to our dearest interests, art lived, and architecture never ceased to develop itself in forms of beauty and of use. It is nevertheless true that the advancement of the arts of peace is greatly promoted by public tranquillity and commercial prosperity; but it is equally true, that art manifests a constant progress, let the circumstances of the times be what they may.

It should be remarked that progress in architecture means the acquirement of knowledge in all that pertains to architectural science; it is therefore obvious that a high degree of excellence in that art can only be effectively promoted by insisting on a thorough course of education on the part of those who propose to enter the profession.

A uniform system of study should be faithfully pursued by every student, first in the college or technological institute, and then in the office of some professional architect, whose certificate, duly countersigned by order of the American Institute of Architects, after a proper examination under such rules as it may hereafter be deemed expedient to adopt, shall be his warrant for practising his art; and those only who shall thus have been systematically inducted into the profession should be recognized as fitted to pursue its practice and assume its responsibilities. The interests of architects demand the adoption of some such measures, and the interests of society demand it more.

A large portion of those who assume the title of *architect*, and publish themselves as such, have never pursued any systematic course of architectural study, and are wholly unfit to take upon themselves the responsibilities of the profession; it is therefore important to adopt some means by which such persons may be distinguished from architects who have been properly trained, educated, and prepared for the practice of their art. The system of certificates or diplomas, as suggested, would partially meet the case; but more than this will be required wholly to abate the evil.

The study of the sciences, upon which a proficiency in architecture mainly depends, having become a distinctive department in many of our colleges and technological institutes, students desiring to prepare for the practice of that art now have opportunities to acquire a far more thorough training in the courses of study which pertain particularly to architecture than could possibly be acquired in an architect's office.

I may be permitted to say in this connection that the influence exerted by the Massachusetts Institute of Technology on the proper training of art students is putting Boston far in advance of any other city in the Union; and we may hope that erelong opportunities will be afforded, at all our seats of learning, for the special training of students intending to pursue architecture as a profession.

Those who go through a collegiate course of study in the sciences which underlie architecture, with a view of becoming architects, undoubtedly lay the best possible foundation for excellence in the profession. They are thus prepared for the attainment of a more practical knowledge, which, it should be remarked, can only be acquired in the office of an architect, where the every-day practice of the profession affords facilities for the completion of a thorough architectural education, which no amount of theoretical training alone could ever accomplish.

I should not feel justified in omitting to say something on this occasion in relation to the very objectionable process of procuring designs for public works by open or general competition, — a process to which architects of standing in the profession will rarely submit.

The subject has often been brought before the Institute, but thus far the evils of the system have never been so treated as to secure satisfactory results.

The *modus operandi* of such competitions is bad from beginning to end. The work to be competed for is usually put in charge of a committee, or commission, as the case may be, who issue a general invitation to architects, by advertisement or otherwise, to exercise their skill in preparing designs, specifications, and estimates for the proposed structure. The inducement held out to them to enter the lists consists of an offer of some three or four premiums, to be awarded to such as may be adjudged to have submitted the most meritorious designs. But what is to become of the rest of the competitors? Every one of them must necessarily have devoted no small portion of time to study and to personal labor, in the preparation of his designs, besides incurring expenses always incident to such an undertaking; none, however, but the happy few to whom the premiums are awarded receive any show of compensation, the remaining candidates for the prizes being "left out in the cold," with the unenviable satisfaction of enjoying "their labor for their pains." Architects should let all such competitions severely alone: they are unqualifiedly objectionable in whatever light we may view them; they deprive the public of the use of the best talent in the profession, and greatly injure all who compete for the prizes, and prove unsuccessful, subjecting them to a worse than useless expenditure of time and brains and money, and often to a greater loss, — a loss of self-respect.

As a general rule, no architect should consent to perform professional service, without a reasonable compensation. "The laborer is worthy of his reward."

Competition of any kind is no more necessary in architecture than it is in other learned professions; but public opinion being in its favor, it remains for architects to seek to remove, as far as may be, the evils attending it.

The only just and equitable method that appears to be practicable to obtain competitive designs for a public work, is for the authorities intrusted with its management to select a given number of architects, and to extend to each a special invitation to furnish designs in competition, under a schedule of graded premiums, corresponding in number with the competing architects, care being taken that the lowest premium is sufficient to cover the expense of producing the design, so that no competitor could be an actual loser by the operation.

In all such competitions the drawings should be made to a similar scale, and finished without coloring. After their reception by the building committee or commission, they should be submitted to a board of experts, consisting of at least three non-competing architects of acknowledged proficiency in the science of architecture, selected from the Fellows of the American Institute of Architects, and two civil engineers of undoubted skill in their profession. The board of experts thus constituted should examine the several designs, and whatever decision they arrive at, as to their relative merits, should be considered as final; and the competitor receiving the highest premium should be appointed architect of the building at the usual rate of compensation for his services.

By thus limiting competitions to a given number of selected architects; by referring the designs they submit to a board of experts of acknowledged skill; by awarding graded premiums according to merit; and by appointing the competitor who receives the highest premium the architect of the proposed work, — the evils of competition may, in a great measure, be avoided.

The propriety of using our best efforts to bring about the establishment of a system somewhat in accord with the suggestions I have here ventured to make, cannot be doubted, in view of the fact that committees or commissions, who usually have the management of our public works, have, with but few exceptions, no knowledge whatever of the fitness of an architectural design for the purposes for which it is intended. They are in most instances, it is true, gentlemen of respectability, of general business qualifications, and of intellectual culture; but it is equally true that few, if any, of them have ever given architectural science the least intelligent attention. However unexceptionable they may be in their daily avocations, and whatever business tact they may have for conducting a public work, they cannot be expected to be capable of passing judgment on the merits of architectural designs, either as it regards the purposes for which they are intended, their æsthetic properties, or their principles of construction. It is therefore not only proper, but highly necessary, for all such committees or commissions to call in scientific skill to lead them in their decisions on matters so vitally connected with the well-being of society as the architectural fitness and propriety of its public edifices.

A correction of the evils which exist in the present methods of competition is rendered difficult by the want of a proper appreciation by the general public of what is due to the profession. The subject is one to which the Institute would do well to give serious consideration.

Permit me to allude to another subject that materially concerns the well-being of our profession: I refer to the propriety of cultivating a higher degree of professional etiquette among architects, the practice of which would undoubtedly lead to a better understanding of our art by the public, and to a higher appreciation of its professors. Very many architects, otherwise highly respectable in their calling, seem to be impelled by some irresistible power to criticise unsparingly the works of others. This is a most pernicious practice for any one to indulge in. To detract from the merits of the works of fellow-professors, in one of the noblest arts of civilization, cannot fail to lower the standard of the profession in the public estimation.

We designate our practising members Fellows and Associates: we mean by these terms, a vital principle of professional life; they imply fellowship, not enmity. They mean, in this connection, union of purpose in promoting the interests of the profession, and elevating it to its proper place in the public mind.

As to our individual ideas of the æsthetic handling of architectural subjects, these will necessarily be as different as our tastes, our cultivation, and our habits of thought are different; but it is neither generous, modest, nor graceful for an architect, however eminent he may be in his profession, to detract from the works of others simply because they do not square with his own ideal standard.

Our late president, whose words of wisdom and sound logic have ever been grateful to us, said in his address at the opening of the First Annual Convention of the Institute: —

"We complain, and sometimes justly, of the irrelevant, and to say the least, disreputable criticisms of others. I say this because mere loose observations and remarks strike at the reputation of others, and sometimes do great and lasting injury to them. If we cannot speak in commendation of another's work, we will say nothing."

Such words as these, coming, as they do, from the Nestor of American architecture, are, in the language of Solomon, "like apples of gold in pictures of silver." Let us heed them.

In conclusion, gentlemen, permit me to say, that although the American Institute of Architects is complete in its organization, and its work thus far has been admirably done, we must bear in mind that art is progressive, that we are progressive, and that the Institute is or ought to be progressive: the work of to-day will not exonerate us from the work of to-morrow.

One of our most effective movements in the line of progress has been the establishment of local chapters; but these must be sustained and encouraged, their membership increased and their number multiplied, until all the centres of civilization throughout the land shall send to our annual gatherings representatives of similar branches of the Institute, alive with the energies of art, and imbued with the universal idea of progress. My own opinion is, that an important branch of our future labors will lie in this direction.

In a country of such vast extent as ours, we could not have succeeded without chapters; they are the life-blood of our organization, vitalizing our existence, and imparting to it breadth and dignity. We are all members of chapters, as we are members of the Institute. By this dual relationship we are brought into harmonious accord, a spirit of emulation is promoted, and our extended and diversified interests are unified under a federal head. We have therefore important work to do in our respective bailiwicks, to which it becomes us to devote our best energies.

The respectability of the profession has already been greatly promoted by the establishment of the Institute, and we have a full share of the public confidence; if, therefore, we are true to our interests, it will not be long before we become a necessity of the age and an honor to our country.

A NEW STYLE.

BY A. F. OAKEY, OF NEW YORK.

So many eminent authors have written on this subject that it would seem little remains to be said, and yet I think that a careful comparison of the views of the best authors naturally suggests a conclusion that I find, whether intentionally or not, omitted or rather not developed in any of them. Mr. Fergusson says that a new style is to be found in a development of the Italian Renaissance, that no progress is possible in Gothic or Greek, and further that archæology is not architecture; while Mr. Garbett, condemning the servile copyist as strongly, points to the possibility of a new style in the one constructive principle that has never yet controlled a style, *i. e.*, "the tensile." He believes that the depressive and the compressive have been exhausted, and that a system embodying "the tensile," together with a "generalized imitation of nature," is the goal we seek. Guillaume agrees with Fergusson in the main, but looks for no change till architects are guided by science more than tradition. Much has been written by other distinguished professors, but in these three we have the sense of the discussion in its latest stage. I have looked in vain in the works of these authors, and in those of many others, for a statement or suggestion of a theory, whose apparently unconscious corroboration has been, in Mr. Fergusson's case at least, the work of his life. I cannot read his history without being struck with the completeness of the evolution its pages record; there is no missing link in this work of nature, for I must believe architecture, as an expression of the longings and aspirations of physical and intellectual man, the work of nature, as actually as anything Mr. Huxley can enlighten us upon. Until the fifteenth century neither the whim of this or that architect or client, or the accumulated traditional pedantry of either or both, could avail against the natural growth of forms born of bodily needs or religious superstition. The changes that were made from time to time, owing to climatic influence or as the result of political or religious revolution, were as naturally consequent as the changes in the structure and exuberance of a vegetable when transplanted, or by treatment brought to a high state of cultivation. The cultivation must be in the right direction, the inherent and essential qualities of the plant must be cultivated, or the species dies out, and we have nothing left but the chromo in the book to record how beautiful a flower it once bore. Why do we need now what the world never desired before? Why are we divided to-day between the revivalists and the novelty hunters, — and this last occupation the lowest incentive to architectural, I might say all, effort? On the one hand, are we to accept the conclusions of the fifteenth century as final in architecture more than in astronomy? and on the other, is there not an inherent fitness in things, in form, consistency, and expression, that absolves us from any responsibility as to their age or novelty? The answers to these questions are not in favor of tin gargoyles, or, in fact, constructive lies of any kind As Sir Joshua Reynolds says, "The natural appetite of the human mind is for truth, whether that truth results from the real agreement or equality of original ideas among themselves, from the agreement of the representation of any object with the thing represented, or from the correspondence of the several parts of any arrangement with each other. It is the very same taste which relishes a demonstration in geometry, that is pleased with the resemblance of a picture to an original and touched with the harmony of music." And again what he says of other arts could well include architecture: "On the whole, it seems to me that there is but one presiding principle which regulates and gives stability to any art. The works, whether of poets, painters, moralists, or historians, which are built upon general nature, live forever; while those which depend for their existence on particular customs and habits, a partial view of nature, or the fluctuations of fashion, can only be coeval with that which first raised them from obscurity." In what I have quoted, has not Sir Joshua said enough to cover the whole field of art? and yet we continue to this day to waste our clients' money in mediæval towers and the like conceits, as if we expected to be undermined by our neighbors, and to be consistent with which scenic representations we should go masquerading in shapes with chain armor under our doublets. To offset these archæological diversions we have the provincial builder, with his jigsaw and his balloon frame, and we find ourselves admiring the progress of the engineer as the only worker in the field who has thought for himself, accepted the limitations of his problems and met them with ingenuity. Only his lack of artistic training enables us to find a living in our practice, unless we are content to be called upon to minister only to the unnecessary and luxurious evidences of civilization, and to take no part in the development that *will* go on whether we move with it or not.

It seems to me that Mr. Garbett is nearer the truth with his development of "the tensile system" than Mr. Fergusson with his Italian Renaissance, for this principle already shows its influence strongly in all our utilitarian work; but why should we discard the "depressive and compressive" simply because there is no room for invention in their application? Ought we not rather to be glad that the earth's surface abounds with the truest examples to guide us in our work? It is no argument against a composite system of construction that we have no precedents. We are in no sense bound to adhere to the peculiarities of any age. The question must always be one of the best means to an end; and if the end is reached, the means excuse themselves, especially as they are so bound up in it as to make it impossible to achieve a satisfactory result with insufficient means. Why have we not the courage to think for ourselves, and when we are asked in what style we have expressed our thoughts, to answer that we do not think it necessary to classify and ticket everything with one word, to name an ever-varying system that eludes such an attempt?

"The Eastlake style," forsooth, is even now a recognized term, and yet it would puzzle the quill-drivers or any one else to say in what it consists. I like the old English definition of architecture, "the art of well building," and what is not well and truly built does not deserve the name. This, it seems to me, is all we have to concern ourselves, — to study each problem by itself; and having met the requirements in plan, as we build up upon it, who shall hold us responsible for our style, if every purpose that was intended is served by ingenious constructive economy? I do not wish to inveigh against suitable and necessary decoration, necessary as regards the phonetic expression of a design; but I can see no reason for reviving the mediæval grotesque, or of "shutting fair daylight out" of a building where light is a desideratum, because we have precedents for these dispositions. And there 's the rub. Have we precedents for any such thing? No more than we have precedents for stone spires made of wood. If there is one fact connected with the examples we blindly imitate, it is that they were built for purposes which they fulfilled, and there is ample internal evidence that their designers would have treated our problems in an entirely different way.

Because our ancestors were fortunate enough to unearth the classic poets, and unfortunate enough to consider it necessary to revert in everything to the classic type, we have been obliged to go all over that old ground, and it is not our fault if we have not repeated every vagary of every decline, until we find ourselves where we started. Now that it has taken all these centuries to find the road we have strayed from, are we going to wander around the monuments of past ages, rhapsodizing over that detail, that has lost its significance in our day, — ignoring the great principles that could lead us on and mumbling about a new style? No man or whole professional brotherhood can saddle the world long with what it does not need to satisfy its utilitarian ends or its religious thought, and it is worse than idle to grumble at the sway of the mighty dollar, to give, as an excuse for constructive lies, the reason that the money was not forthcoming to pay for a real stone vault or flying buttress. If the stone vault had been necessary, the money would have been forthcoming. The mighty dollar is the power of our age, and a power that places every process and every material within our reach if we would only avail ourselves of our opportunities

The underlying principles that enabled the mediæval architects to command our admiration and respect are as true to-day as they were then, and it is only by their application to our needs that we can achieve as grand results as ever expressed the political or religious civilization of any people; while we have the incentive of making our achievements, forever, stepping-stones for future generations in search, not of a new style, but of truth.

FIRE-PROOF CONSTRUCTION.

[A paper by F. Schumann, C. E., read at the Eleventh Convention of the American Institute of Architects.]

GENERAL REMARKS.

No material used in building construction, except brick or burnt clay, is practically fire-proof. A building constructed of incombustible material throughout, and stored with only small quantities of combustible and inflammable matter, can be considered fire-proof. Warehouses for the storage of miscellaneous merchandise cannot, with our present knowledge, be constructed absolutely fire-proof; we can only apply devices that diminish the danger by confining and localizing the conflagration. Generally, public places of amusement, churches, schools, offices, or dwellings do not contain so much inflammable matter, such as furniture, etc., as to materially injure or endanger the safety of the building when properly constructed. Warehouses, when stored with inflammable matter, even if constructed entirely of brick, but without precautionary subdividing walls, forming compartments, will succumb to the heat, by reason of the great expansion causing a movement of the walls and ultimate collapse of the floor arches.

All constructive iron-work in buildings, except those having small quantities of combustible furniture in them, should be protected from the direct action of a fire by some fire-proof and non-conducting coating, securely fastened to the member it is intended to protect.

The maximum temperature of a vigorous fire, raging in a building fed by combustible and inflammable matter stored therein, may be correctly assumed at 2,000°, — equal to that in brick furnaces. It is found that the strength of iron is diminished about 66% when at a dull red heat, or a temperature of 977°; at this temperature, iron-work proportioned to three times safety, would be at the point of failure. We will compute, approximately, the time required in raising to 977° the temperature of a cast-iron plate one foot square and one inch thick, representing the side of a square column. The amount of heat required to raise the temperature of the plate to 977° is — the specific heat of cast-iron being 0.13 units, and the weight of the plate 40 pounds — $977° \times 0.13 \times 40 = 50{,}804$ units. The conducting power of the plate, under the existing circumstances, is $233\ (2{,}000 - 977) = 238{,}359$ units per hour, and as we have only 50,804 units to conduct, the time will be $\frac{50804}{238359} = 0.213$ hours $= 13$ minutes. If the plate be protected by a layer or coating of ordinary plaster, one inch thick, the amount of heat conducted will be only 3.86 (2,000 — 977) = 3,949 units per hour, or $\frac{50804}{3949} = 13$ hours longer; when protected by 4½ inches of brickwork, only $\frac{483\cdot(2000-977)}{4\cdot5} = 1,100$ units per hour will be conducted, or $\frac{50804}{1100} = 46$ hours longer.

Buildings stored with large quantities of inflammable matter may have cast-iron columns of square cross section, of the necessary dimensions to carry the superimposed weight, with skew-backs cast on, for supporting brick arches between the columns that carry the floors; the column is enveloped by 4½ inches of brickwork, as a protecting layer only. This method, shown by Fig. 7, admits a considerable reduction of the size of piers from those built of brick only; for example: The height of a pier is 18 feet, and the weight to be carried 100 tons; a cast-iron column 10 inches square, with thickness of metal 1 inch, will carry the weight with eight times safety; 4½ inches of brickwork will increase the size of pier to 19 inches. A solid brick pier, allowing 70 pounds per square inch as its safe resistance to crushing, will carry only $\frac{192\times70}{2000} = 12.7$ tons To support a weight of 100 tons, the pier would have to be $\sqrt{\frac{100\times2000}{70\times144}} = \sqrt{19\ 91} =$ 4′ 6″ square.

It is asserted that iron is unsuitable for fire-proof construction, by reason of its failure when exposed to a certain degree of heat. That this is so is of course admitted; but, nevertheless, it is the only material at our disposal suited to modern requirements; and the architect will meet with more satisfactory results in devising means and methods for its protection against the destructive effects of fire, than by discarding it.

Columns or girders of wood resist the destructive effects of fire much longer than if made of iron exposed. The necessary dimensions, however, except for comparatively light structures, are such as to make the use of wood for those purposes impracticable; for example: A column of oak 18 feet high and one foot square will support with safety 25 tons, while a hollow cast-iron column, one foot square and one inch thickness, of metal, will support 119 tons. So, also, will a beam of yellow pine 15 inches square, 15 feet span, and uniformly loaded, carry 16 tons, while three 15-inch light-rolled iron beams, lying side by side and occupying about the same space, will carry 69 tons.

CLASSIFICATION OF FIRE-PROOF STRUCTURES.

I divide fire-proof buildings into three classes: —

Class I. embraces those structures in the construction of which only incombustible material is used, and all constructive iron-work is properly protected against the action of fire.

Class II. embraces those structures into the construction of which incombustible material enters, but the iron-work *not* protected by fire-proof and non-conducting coatings. Suitable for buildings not containing so much inflammable matter as to injure or weaken the iron in case of fire.

Class III. comprises all buildings in the construction of which combustible material is used, but all vital members protected by fire-proofing.

DETAILS OF CONSTRUCTION.

Class I. or II. In the construction of Class I. all combustible material is rigorously excluded, except for doors, window-sashes, stair-rails, flooring, and skirting. The external faces of outside walls may be either of brick, sandstone, or granite; the backing to be of brick with a hollow space two inches wide, located one brick distant from the inner face of the wall. All openings in the brickwork to be arched. Roof construction, furring, and lathing, of iron. The floors to be constructed of iron beams, supporting arches of brick (Fig. 1), hollow tile (Fig. 2), or corrugated sheet iron (Fig. 3); the haunches and crown to be filled with concrete, level with the tops of the beams.

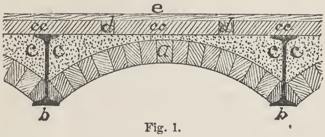
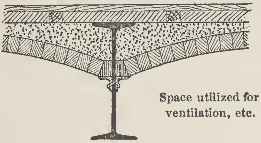


Fig. 1.

ARCHES OF BRICK.

Weight of construction from 60 to 100 lbs. per sq. ft.; *a*, single rim arches of brick, up to 8 ft. span; rise of arch, $\frac{1}{12}$ of span; *b*, rolled iron beams; *c*, concrete filling; *d*, strips of wood 2″ × 2″, about 16″ from centres; *e*, flooring nailed to strips *d*; *cc*, filling between strips.



Space utilized for ventilation, etc.

Fig. 1′.

The arches may be supported on angle irons riveted to webs of deep beams.

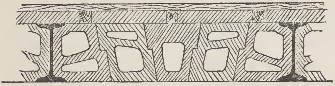


Fig. 2.

FLAT ARCH OF HOLLOW TILE, FROM 6 TO 14 INCHES DEEP.

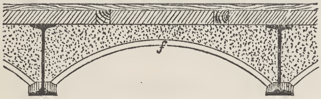


Fig. 3.

ARCHES OF CORRUGATED SHEET IRON, ABOUT NO. 20, B. W. G.

Weight of construction from 40 to 100 lbs. per sq. ft. *f*, corrugated sheet-iron arches up to 9 ft. span; rise of arch as desired.

When floor-tiles are used, they should be bedded in about one inch of cement, spread over the concrete; when of wood, wooden strips two by two inches, to which the flooring is nailed, are bedded on the concrete from sixteen inches to two feet apart; the spaces between the strips being filled with cement mixed with fragments of porous brick. Practically there is no difference between the above methods as to strength, but considerable in weight, the order being as follows, commencing with the lightest: hollow tile, corrugated sheet-iron, brick. When ceilings are to be plastered, the plaster is applied directly to the brick arches and hollow tile; the corrugated iron arches are merely painted. When flat ceilings are required, iron lath is riveted to small > or ⊤ irons that run from and rest on the bottom flanges of the beams; the hollow tile is generally made for flat ceilings.

It is important that the soffits of beams and lath to iron girders receive a coat of some good fire-proof and non-conducting material, not less than one inch thick, and securely fastened on. A mixture of asbestos and pipe-clay is very effective. The soffits of floor-beams may also be pro-

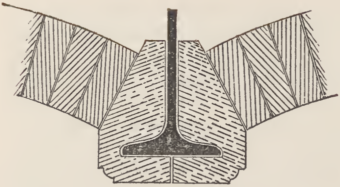


Fig. 4.
PROTECTION OF LOWER FLANGE OF BEAMS. CLASS I.
Burnt clay skew-back, formed to lap flange.

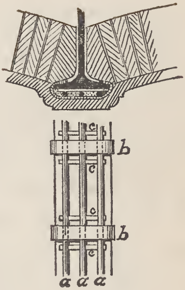


Fig. 5.
PROTECTION OF LOWER FLANGE OF FLOOR BEAMS.
View from below. *a*, iron rods ½ inch diam.; *b*, flat hoop iron bent around flange, about 4 feet apart; *c*, wedges; *e*, plaster.

tected by the brick skew-backs of arches being made in such a form as to lap the lower flanges of beams. (See Figs. 4 and 5.)

The shafts of cast-iron columns should be continuous from middle to middle of the floor thickness, enveloped with not less than one inch of some fire-proof, non-conducting material, securely held to the shaft by buttons or ribs imbedded in the material. The capital and base should be of cast or sheet iron, fastened to lugs or bosses cast on the shaft, and long enough to pass through the envelope. (See Figs. 6 and 7.)

If light partitions are required, such as do not start from the foundation, and for which common brick would be impractica-

CAST-IRON COLUMNS.

No portion of the constructive iron-work exposed.

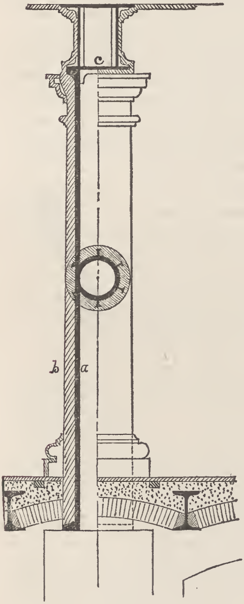


Fig. 6.
Inner shell of shaft *a* of cast-iron; *b*, protecting envelope of a fire proof, non-conducting material.

SECTION ELEVATION.

No part of the iron exposed.

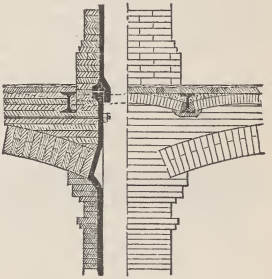


Fig. 7.
Cast-iron columns protected by 4½ ins. of brick. Instead of girders, brick arches are sprung between columns for supporting the floors.

ble by reason of its weight, hollow terra-cotta tile or brick can be used. Another method, more expensive, but admitting a construction which is self-supporting, consists of light I-beams, generally four inches deep, placed vertically two feet from centres, with the ends riveted or bolted to plates or channel-irons secured to the floor and ceiling; to these beams the iron lath is bolted for receiving the plaster. These partitions can be readily trussed, so that they add no weight to the floor from which they start.

All steep parts of slated roofs are provided with rolled iron purlins, **T** or **L** shaped, weighing about two pounds per linear foot, riveted to the jack-rafters or trusses. The spans of these purlins should not exceed six feet for slate weighing ten pounds each. The distance between centres of purlins depends upon and is always equal to the weathering of the slate; one purlin is required for each line of slate; for example: a slate 12×24 inches, showing ten inches to the weather, with four inches lap, requires the purlins to be ten inches from centres. The slate is fastened to purlins by No. 16 B. W. G. copper wire passing through two holes in the tail of the slate and around the purlin. (See Fig. 8.) Another method, more expensive, but in proportion to its greater security, consists of two $\frac{3}{16}$ inch diameter bolts with heads countersunk in the slate, and fastened with a nut to a hook hanging to the purlins. (See Fig. 9.) Instead of purlins, corrugated sheet-iron is sometimes used, running from rafter to rafter; to this the slate is fastened by wrought-iron pins, countersunk and passing through the slate and corrugated sheets, where they are bent so as to form a hook or clinch; the slate may also be bedded in a layer of cement applied to the corrugated iron. (See Fig. 10.)

SLATED ROOF.

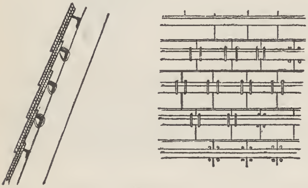


Fig. 8.

INSIDE VIEW OF SLATE AND PURLINS.

Slate fastened to **L** or **T** shaped rolled iron purlins with No. 16 B. W. G. copper.

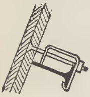


Fig. 9.

Wrought-iron countersunk bolt, 3-16″ diameter, and hook, 1″ x 1-8″, hanging to purlin.

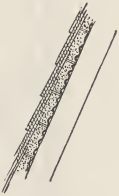


Fig. 10.

Slate fastened to corrugated sheet-iron by wrought-iron counter sunk pins. Slate is also bedded in a layer of cement applied to corrugated iron.

Flat parts of roof are covered with either cement, copper, lead, zinc, tin, or galvanized sheet-iron; either one of the metal coverings are fastened to a layer of cement, about one inch thick, overlying concrete supported by corrugated sheet-iron arches, by the tags imbedded therein. (See Fig. 11.) The supporting material may

FLAT ROOFS COVERED WITH METAL SHEETS OR CEMENT.

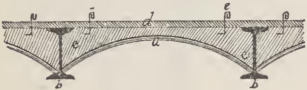


Fig. 11.

ARCHES OF CORRUGATED SHEET IRON NO 20 B. W. G.

Weight of construction from 40 to 60 lbs. per sq. ft. *a*, corrugated iron arch; *b*, rolled beams; *c*, concrete filling; *d*, layer of cement; *e*, metal tags for fastening metal cover.

also consist of burnt clay tile, resting on T-irons. (See Fig. 12.) Another very good method consists of metal boxes filled with fire-proof material; the boxes are about two feet wide, from two to three inches deep, and of lengths up to eight feet spans; the bottom, sides, and ends are formed of galvanized sheet-iron, and the top of copper or galvanized sheet-iron; the boxes are placed alongside of each other and fastened to the beams of the roof. This method possesses an advantage in that it is light, strong, overcomes the difficulties from expansion and contraction, and forms a smooth ceiling. (See Fig 13.)

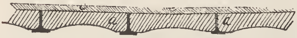


Fig. 12.

BURNT CLAY TILE, ABOUT 16 INS. SQUARE AND 3 INS. THICK.

Weight of construction from 15 to 20 lbs. per sq. ft. *a*, tile; *b*, rolled T-irons weighing from 3 to 6 lbs per linear ft.; *c*, layer of cement about 1 in. thick.

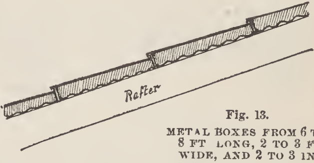


Fig. 13.

METAL BOXES FROM 6 TO 8 FT LONG, 2 TO 3 FT. WIDE, AND 2 TO 3 INS. DEEP.

Weight of construction from 12 to 15 lbs. Boxes are filled with non-conducting fire-proof material.

Fire-proof doors and shutters are indispensable. They consist either of sheet-iron boxes filled with fire-proof material, or layers of corrugated sheet-iron riveted together; they are also made of a sheet-iron plate surrounded by an iron frame forming an open box, into which a fire-proof preparation is filled and secured by lath of a peculiar construction; this is an effective shutter or door, in that the fire-proof material is directly exposed to an encroaching fire, and no part of the metallic construction is in danger of warping and the material falling out. It is essential, to insure a proper working condition of shutters in warehouses or factories, to so construct the shutter that it can be attached to the glazed sash, and that both will slide on the same bar or track so that the sash cannot be opened without also moving the shutter. In buildings where subdividing fire-walls are made use of, it would be well to so arrange the shutters that they can be operated from an adjoining room or compartment by means of rods or endless chains.

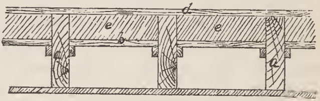


Fig. 14.

ORDINARY FLOORS.

Maximum weight 40 lbs. per sq. ft. The filling may consist of clay mixed with cut straw. *a*, joist; *b*, counter-ceiling; *c*, wooden ceiling; *d*, flooring; *e*, fire-proof, non-conducting filling.

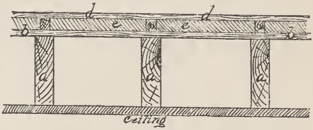


Fig. 15.

ORDINARY FLOORS.

Maximum weight 30 lbs.; is more effective than Fig. 14 against fire from below.

Class III. All girders, joists, struts, and roof timbers to be of wood, and, if possible, of large scantling. All floors to be counter-ceiled so that not less than two inches of non-conducting material will lie between the flooring and counter-ceiling. The spaces between the scantlings of partitions to be filled with mortar or a mixture of clay and cut straw not less than one foot above the floor level. (See Figs. 14, 15, 16.)

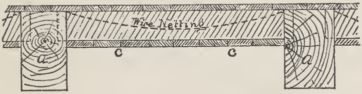


Fig. 16.
SUITABLE FOR HIGH ROOMS.
Joist of large scantling from 4 to 8 feet apart. Maximum weight 50 lbs. The dotted line represents a continuous coarse wire netting, nailed to joist and imbedded in the filling; it is for the purpose of retaining the filling in place should the ceiling boards be burnt through.

The roof construction may be of wood. For the slated parts strips of wood 2 × 2 inches are nailed horizontally to the sheathing boards; the spaces between strips being filled, level with their tops, by a mixture of clay and cut straw or any other fire-proof non-conducting preparation. The same method is also used for flat parts of roofs, the metal tags for holding roof covering being nailed to strips.

The sketches hereto attached illustrate the various methods described.

COLONIAL ARCHITECTURE.

[Paper read before the Eleventh Convention of the American Institute of Architects by R. S. Peabody, A. A. I. A.]

THE English Queen Anne designers have a way of justifying their many vagaries as follows. They say, In the seventeenth century men had rather ceased to think of "style." Classical detail as introduced in Renaissance days had become completely naturalized. Ceasing by degrees to be used in a servile way, or with great regard for precedent, it simply served to make things seem attractive without maintaining purity of style, or style at all. Following this came the successive revivals of Palladian art, then of Grecian work, then of all the phases of Gothic, — all these lifeless imitations of the antique. From this study of archæology the Queen Anne men profess to rebel, and to turn to the point where our art was before all this direct imitation of obsolete forms began. They find more of the spirit of independence and of the carelessness for precedent which they like in the work of the seventeenth century than elsewhere; so they study and work on that basis, but are ready to combine anything with it which is attractive. They say they have red bricks and white mortar for their walls, tiles for their roofs, and white sash frames for their windows; and of these the house shall be made.

All this sounds like good reasoning, although in practice the antiquarian spirit makes the movement seem much like other revivals. In fact we really know that reasoning is not at the bottom of it at all, but that Mr. Norman Shaw and others like him admired and studied and sketched all the quaint old work they could find, and that this work, enlivened by their talent, has set a quickly imitated example to other designers. If we follow their lead without any native Jacobean or Queen Anne models of importance to study from, we shall but be adding one more fashion to our already rather long list. A neo-Jacobean table can join the Eastlake chairs, the American rococo mantel, and the Puginesque sideboard in our dining-rooms; but there is nothing in this but an additional fashion. Now, however, that this current is felt along our shores, can it not be directed into more fitting channels here even than it has worn for itself in England? We too have had our revivals; but if we go behind them, we find in the Georgian days, men working without thought of style, simply, delicately, beautifully. Many a choice wooden cornice, many a stiff mantel in our farm-houses, attest this. Plancia, fascia, and soffit still are Yankee words in spite of our mediæval period. With our centennial year, have we not discovered that we too have a past worthy of study? — a study, too, which we can subsequently explain and defend by all the ingenious Queen Anne arguments, strengthened by the fact that our colonial work is our only native source of antiquarian study and inspiration.

Put our heirlooms — any old material we have — into a Gothic room; it is more or less out of keeping. In fact, with these successive fashions, we have to build not new houses alone, but all their furnishings to match. Our heirlooms are tall clocks, Copley or Stuart portraits, convex mirrors, ancient chests and drawers, bits of carving perhaps by Gibbons, Paul Revere tankards or andirons, brass candlesticks, and chairs that came over in the "Mayflower." We think with interest of the parish glebes of Cambridge and Portsmouth, of the old Tories' Row in Cambridge; while many are the old wainscoted rooms for which we have an affectionate remembrance; the staircases with boxed steps with a rich scroll under each box, and with the varied balusters carved into a twist by hand; the great brick chimney-corners with Dutch tile borders, and crane, pothooks, and trammels, and hanging kettles, and the yawning flues resting on oak mantel bars and opening a clear road to the stars above. With all this in the old houses, we find a classical detail universally used, the common language of every carpenter, and treated freely, with regard only to comfort, cosiness, or stateliness, and with no superstitious reverence for Palladio or Scamozzi, those bugbears of later years. In studying this colonial work, we find all the delicacy, grace, and picturesqueness that any model can suggest to us; and combined with it a familiar aspect, and a fitness to harmonize with all those heirlooms and old possessions, that might be put to shame by other fashions. In short, we like it all; and if we want to excuse it we can, with the Queen Anne men, say we are returning for models to the time when men worked naturally and without regard to style, and that on that stock we propose to graft whatever else now attracts us.

I have said that our sources, and the period that interests us, varied from that which the Queen Anne men affect. True, we have our Charles River, our Cape Ann, our Queen Anne's Corner, and we have many houses of early date. The Craddock mansion was built in the days of Charles the First; the Fairbanks house in Dedham and the Curtis in Jamaica Plain, during the Commonwealth; and these are still occupied by the families of their builders. The Province House is of the time of Charles II.; the Sudbury Inn of James II.; the Batchelder House in Cambridge dates from William and Mary; the Old Corner Bookstore, from Queen Anne; while the President's House and Massachusetts Hall at Cambridge, and the Adams (once Vassal) House at Quincy, all date from the reign of George the First. These are but representative houses; but yet the richest and finest models we have date from between 1727 and 1760, when George II. reigned: Pepperell House in Kittery, 1730; Hancock House, 1737; Royall House, Medford, 1738; Holden Chapel, Cambridge, 1745; Wells mansion, Cambridge, 1745; Wentworth House, Little Harbor, 1750; Longfellow (Vassal) House, 1759; Ladd House, Portsmouth, 1760.

If we study these colonial buildings, we see nearly all the early work in this neighborhood roofed with steep-pitched gable roofs. Rare instances occur, like the stone Craddock House at Medford, when the gambrel roof appears earlier; but from 1686, the date of the Sudbury Inn, to 1737, the date of the Hancock House, the gambrel roof is common. Later it became frequent to pitch the roof in from all sides to a ridge or to a second pitch surrounded by a balustrade, and it is under such roofs that the richest interiors of our neighborhood still are found; such as the Longfellow and Wells and Riedesel houses in Cambridge, the Ladd and Langdon, at Portsmouth, the Winslow at Plymouth, the Lee at Marblehead.

Thus we see that the gambrel roof is typical of but one period of colonial work. Where it came from is not clear. There probably is no English type of the sort, and if somebody can explain it it would be interesting. It is said that the bricks of Peter Sergeant's house, afterwards the Province House, were brought from Holland; and it is at about that date that the gambrel roof became prevalent. Is it a reminiscence of Holland, and are the Knickerbockers of New York or Dutch William in England responsible for it?

The later and richer mansions were large and square, and with so little detail outside that one built now would, without the glamour of age, seem unpleasantly angular and box-like. But this is by no means a characteristic of all colonial work. The old Fairbanks House at Dedham, partly early with high-pitched roof, and partly later with gambrel roof, forms a most picturesque pile; and so does the scattered house at Little Harbor, with gables at different heights and floors at different levels; the council-chamber wing running off at an uncalled-for angle with the main building, that would delight Mr. Norman Shaw. Again, among the gambrel roofs, the great, lumbering Sudbury Inn forms a most hospitable group, with its wide-spread barns and out-houses; while the Goodman cottage at Lenox smiles through its shrubbery, and winks its many-eyed sashes at the wayfarer. This picturesqueness I have endeavored to illustrate in the sketches with this paper, and we see that a picturesque group of any sort is thus not incongruous with our purpose; while of the interiors there is no need of words. We all know and like them; and it is because we too want to live amidst wainscoting, nestle in elliptical arched nooks, warm ourselves beneath high mantels at blazing wood-fires, and go up to bed over boxed stairs with ramped rails and twisted balusters, and see our old chairs and pictures thus appropriately environed, — it is because we like and want all this that we seek for an excuse to do it all again. But is n't our liking reason enough?

In all this, I have dwelt on the colonial mansions, not because we have no public buildings. The Old North Church, the Old State House, the Newport State House, the "Old Ship Meeting-House" at Hingham, — all are excellent buildings. But except in peculiar spots, there is less to suggest such work in public buildings than there is in the home. A schoolhouse soon to be built in Deerfield, near the site of the Indian massacre, not unfitly recalls colonial architecture; but for a Western State House there would seem to be no more reason for this spirit than for a Gothic or Italian one. This lays bare at once the thinness of any argument in the matter; and we come back to that always satisfying reason, that in one case it is eminently appropriate, because we like it; and in the other, eminently inappropriate, because we don't like it. For once, at least, let us reason like our clients.

But this, after all, is not a very bad reason, if, as I think. we are past the battle of styles, and the fancies of the artist are become of proportionally greater importance. As soon as we begin to design detail, we must, as it were, talk in some intelligible language, or in a *patois* formed from several. Many influences may guide us to different sources of inspiration. I think we, most of us, admit the good in most of these sources, and feel that as any designing worthy the name will hereafter be done by men who are more artists than their predecessors, so what we shall care for in the design is not its historical accuracy, but the artist's clever art in harmonizing whatever his fancy does lead him to, with itself and its surroundings. From this point of view, whatever the attractions of other sources, from no field can suggestions be drawn by an artist more charming and more fitted to our usages than from the Georgian mansions of New England.

ESSAY UPON SANITARY SCIENCE.

[Delivered Oct. 18, 1877, before the American Institute of Architects, by Col. G. E. Waring, Jr.]

Your committee has announced me for a paper on "Sanitary Science." It would better describe the intention of my few remarks to use the expression "In Sanitary Practice."

Our knowledge of sanitary questions lacks very much of what is necessary to scientific accuracy. Not only are the terms of the art more or less vague, but we are still very far from being certain as to our deductions concerning its almost fundamental principles.

We read and we hear a great deal about "sewer-gas," "malaria," and "zymotic diseases"; indeed, the nomenclature of the subject is copious and minute. Yet when we come to ask ourselves how much of all our theories is based on clearly ascertained fact and on demonstrable conclusion, we are forced to acknowledge the really primitive condition of our study.

Many deductions from wide-spread observations are of great practical value; but thus far they remain deductions only. Certain conditions of soil and surroundings point to the probability of fever and ague, neuralgia, and consumption, but the sanitary student is still in the dark as to the physical processes by which such conditions produce such ailments.

Exposure to the emanations of decomposing filth exposes us to the danger of typhoid fever, or diphtheria, or cerebro-spinal meningitis, or scarlet fever, or black vomit, according to attending circumstances; but whole populations are frequently subjected to these dangers without an outbreak of any one of these disorders. Physicans can, thus far, only say that the danger exists. When the disease arises, they are usually able to connect it with its filthy source; but they can by no means demonstrate the exact way in which the cause has produced its effect, nor can they tell why the apparent cause so often fails to produce the frequent effect.

Sewer-gas has no scientific definition. Its composition may be even more various than are the materials from which it is formed, and there is hardly a gas known to the chemist which may not be found at one time or another in our sewers and our drains. There is hardly a house that is furnished with the usual plumbing appliances, which is not more or less pervaded, day and night, with the gaseous emanations of the drains. The finer the house and the more complete its modern conveniences, the more certain it is to be subject to these inroads in all its parts.

If sewer-gas were universally poisonous, very few of our first-class houses would be habitable at all. Why it is that our people so generally live in tolerable health, under conditions which, while they do not always produce, almost invariably accompany, attacks of zymotic disease, no man can say; and until this is known we shall be more modest if we avoid the use of the word "science," confess our scant knowledge, and apply ourselves to the practical avoidance of conditions which we know to be full of undetermined dangers. We have not yet learned why bad air in the house, or outside of it, sometimes produces zymotic diseases, nor why it does not always produce them; but we *have* learned that in its entire absence these diseases do not arise unless brought to us in our food or drink.

The architect, in his relations with his client, is a practical sanitarian, or the reverse. He has far more to do with the health and usefulness and long life of the family which he shelters than the physician can ever have; and he is in far greater degree answerable for its ailments and its weaknesses and its early deaths.

It seems to me that his first great duty — before all art, before all economy, before all constructive ability — lies in the direction of thorough sanitary work. Put a tight roof over our heads, wall out the rude wind, and give us sweet and wholesome air to breathe, and *then* go on with your admirable art and taste and skill; but for Heaven's sake, avoid the mockery of building a beautiful and convenient pest-house.

It seems, in a certain sense, like an absurdity to tell intelligent men the most obvious truths, which they already know perfectly well; but it may well be the case, here as elsewhere, that well-known truths fail of active realization.

It is a part of my professional work to inspect the sanitary condition of dwelling-houses, in town and country, and to advise as to their improvement. You will pardon me if I say that I have never yet happened to examine a single house which had not radical defects from garret to cellar; and I have frequently been called, as a matter of precaution only, to recently built houses whose owners had spared no expense to make them perfectly wholesome. Of course some of these houses are not built by architects at all, but by the "practical builders" who do so much of the bad house-building the whole country over. There is a good excuse for this bad drainage in houses built even eight or ten years ago, or at least the responsibility attaches in such cases to the owners who should have reformed them, not to the architects or mechanics who built them at a time when the new art of healthful drainage was in its infancy.

But there is only the excuse of public indifference to shield the modern builder in view of his almost universal disregard of simple and well-known methods of wholesome house-drainage. He would consider himself blameworthy if his roof leaked so badly as to destroy the wall-paper of a single room; but he expects no blame — he would often scout the idea that he should be blamed — for a condition of interior drainage which lays the whole household open to an ever-threatening danger.

There is, perhaps, the further excuse of usage. It is not the custom among architects, any more than among physicians, to pay special regard to those sanitary questions which should engage their first attention. The house is built in the usual manner, and the patient is treated for the usual diseases. God cares for the rest, and a submissive people accepts the result.

I do not stand here, gentlemen, to ask you to pay some regard to a new subject, and to consider whether you may not profitably give it a modicum of thought. I ask you to consider, after careful study, whether you should not pay it a very profound regard, and accept it as the one part of your duty to the public which carries with it a grave question of life and death.

I do not mean, of course, that, under existing circumstances, any real accountability rests on your profession. As such things go, it is the demand that creates the supply, and the people themselves are thus far at fault. The demand has been for handsome houses, or for cheap houses, or for convenient houses; and these you have supplied with great skill and success.

The time is now at hand when the demand will be for healthy houses first of all; and no one can doubt that the enterprise of your order, ever awakened, will achieve a perfection of sanitary arrangement beyond anything we have thus far conceived.

At present, not one man in ten thousand — literally not one in ten thousand — cares or thinks anything about this matter, beyond satisfying himself that his house has as good plumbing as other people's houses.

His accustomed nostrils detect no odor, even where to one fresh from the country the very entrance-hall is tainted with air from the drains; and where he can neither see nor smell offence, he is quiet and content. He has yet to learn that the most serious danger is often unattended by any very marked warning to the senses.

But a change has begun, and we shall soon find that ten in one thousand are bestirring themselves. It will not be very long before public sentiment will turn from indifference to clamoring demand. The people once realizing the miserable condition of their houses (for which, of course, they themselves are responsible), will cast about for a scape-goat; and you will be fortunate gentlemen, if you succeed in confining their attention to the plumber who has executed their work, and diverting it from yourselves who should have designed it.

Without being in any sense identified with your profession, I have had some knowledge of the degree to which the plumber (the individual or the class), in many instances, guides the sanitary part of the plans and specifications. I am not at all disposed to join in the popular opinion of the plumber. I am brought into frequent intercourse with him, and I have conceived a regard for him as one who does his best under difficult and often tempting conditions. But he is not usually an educated sanitarian, any more than the apothecary is usually an educated physician.

Referring to what I know to be a frequent custom, I would say that the architect is no more justified in leaving the arrangement of supply-pipes and waste-pipes to the mechanic who is to construct them, than the physician would be in leaving the composition of the bolus to the druggist who is to make it up.

In matters of really vital importance the educated professional man should direct every detail of the plans, according to the best light that he can get. He should also exercise such a supervision over the execution of the work as will insure safety at every point.

It would be folly to attempt to say very much about the details of house-drainage work in the few moments at my command here; but there are certain general principles which may be briefly sketched. They are important; and whether they depend on theoretical knowledge or on practical experience, they are sufficiently well established to guide our practice safely.

1. Effete organic matter cannot safely be retained anywhere within the house, nor anywhere within an unventilated drain which opens into the house, — either directly, or with the inefficient barrier of a water-seal trap.

2. Effete organic matter — whether fæces, urine, food refuse, or other waste — passes more or less rapidly, according to its nature, and according to its condition as to temperature and exposure to air, into a state of decomposition. It is not generally resolved at once into its innoxious

elements, but there is an intermediate state where its molecules rearrange themselves into simpler compounds (usually gases), which are again changed into their simple and harmless elements, or into oxides.

The chief agent in the rapid change from the first condition to the third is the oxygen of the common air.

3. It is altogether probable that it is in its intermediate condition that effete matter produces its unwholesome effects; that it is in this condition that it fosters the reproduction of the germs of disease, or the development of whatever disease-producing influence it may possess.

4. Whatever may be the manner in which this foul condition effects its unwholesome influence, its power for harm is much lessened by a copious admixture of common air, — acting both as an oxidizer and as a diluter.

5. All gases — whether the foul air of the soil-pipe or sewer, or any other aëriform matter — are absorbed and given off by water with great freedom. The water in a trap has only a limited effect in retarding the passage of gases from one side of the trap to the other.

6. Air, in the condition which is the very worst in its effect on health, is very often far from stinking gases.

7. Water has the power of absorbing the germs of disease from air with which it is in contact, or of absorbing whatever other agent of infection the air may contain, and of retaining it for a considerable time.

8. Although a water-seal will not prevent the transmission of gases, it does form a barrier to *currents* of foul air, unless subjected to a pressure sufficient to overcome its hydrostatic force.

9. In towns where a proper system of sewerage is provided, and where there is an abundant water-supply, the system of water-carriage is the best means of removing household waste.

10. In the country, the water-carriage system may be perfectly well used, if the absorptive and oxidizing power of the soil be properly employed for its final disposal.

The application of these principles in practice — in the drainage of houses — involves a consideration of circumstances and conditions which vary in different cases. At the utmost, they can only guide and control our practical work. The technical details of arrangement, material, dimensions, and construction, all bear with more or less force upon the general result; but we must keep in view the natural laws and conditions which are essential to good sanitary success.

Most existing work violates the first principle that I have laid down, inasmuch as most of our waste matter is retained in the water-trap of the soil-pipe or drain until sufficiently decomposed to pass away in solution in the feeble current; and as the drain is unventilated, even where it is "vented," and as it has either no barrier at all to the pouring of its exhalations into the house, or only a water-seal which is always ineffective, the decomposition takes place without the presence of sufficient air to carry it quickly to completion, and so establishes the condition most favorable to the production of disease. There is usually a sufficient dilution in the drain or the sewer to prevent stinking, but not enough to avert danger. In very many cases the cistern or reservoir in the house, by which water is supplied for all uses, is accessible — either through its own overflow, or through intermittent supply pipes — to poisonous gases from the drain, which its contents absorb and with which the water used for drinking is tainted, and too often poisoned.

Aside from the dangers inherent in the drainage system of the house itself, it is, if in a city, in connection with a vile public sewer, which is bad in principle, faulty in construction, and a sure source of contamination.

If in the country, it is probably a means for conducting into the house the foul pent-up gases of a pestiferous cesspool.

All of these difficulties may be easily overcome. There is not the least *necessity* for any sort of danger in the use of all the usual drainage appliances in any dwelling-house or public building.

As we are now situated with reference to the public sewerage system in the city, and with the prevalent cesspool in the country, we must arrange to protect ourselves against danger from these sources. We must do away with the use of water-traps so situated that they can retain decomposing organic matter where it will do us harm; we must secure a free circulation of fresh air through all soil-pipes and house drains; and we must either turn our stationary wash-basins out of doors, or secure the absolute closing of their waste and overflow pipes except when they are actually in use.

Especially must the architect, who is the creator of the sanitary condition of the house, learn to apply to its drainage and water-supply system the same intelligent and educated skill which he now applies to its arrangement and beauty.

THE FIRE QUESTION.

[Read at the Eleventh Annual Convention of the American Institute of Architects by P. B. Wight, F. A. I. A.]

In my first paper on the fire question, prepared for the Eighth Annual Convention, which was not read, but subsequently published in the *American Architect*,[1] the subject of prevention was outlined under two heads. The first, comprising the class of so-called fire-proof buildings, was not considered in detail The second, relating to systems of what may be called for convenience "partial fire-proofing" and absolute exterior protection, was discussed at considerable length.

To resume the consideration of the first class, I will quote a few sentences in which it was referred to. After venturing the opinion that we were not likely ever to see a city entirely composed of fire-resisting structures, I said: —

"If, then, each new building cannot be a component part of a city wholly fire-proof, I submit to your candid judgment whether you do not take a fearful responsibility when you recommend the erection of a building wholly of incombustible and consequently very expensive materials, which is to stand for years in the midst of others of a decidedly combustible character. Experience has shown that such a structure must be a veritable fortress against fire; and this is the case in few buildings I know of erected according to systems in use five years ago."

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[1] See American Architect and Building News, Vol. I. pp. 195, 203, 211.

Also the following: —

"The most valuable buildings that have recently been erected in our large cities are entirely unprotected on the exterior, reliance being placed upon the *incombustible* nature of the materials in them. They are in no sense fire-proof when standing among combustible buildings."

First-class fire-proof buildings were described as those (I quote) "wherein the matter of cost is not an element to weigh against the use of any building material or method of construction, so long as it is non-combustible, indestructible by time and the weather, and fire-resisting. . . . In their construction the highest scientific and artistic attainments will always be brought in play. It will always be a matter of great concern how to make them secure against every contingency of fire, whether from inside or outside."

It is but a few years since it was the generally accepted opinion that an incombustible building was fire-proof. And by an incombustible building I do not mean one simply constructed with iron beams and the heretofore-employed materials for bridging the spaces between them, and otherwise finished like those previously constructed inside of wood; but one in which the materials throughout, except perhaps doors and floors, — which convenience demands shall be of wood, — cannot burn. But experience has demonstrated that such structures, though they will not *burn*, may still be *destroyed*. The new problem that confronts us therefore is, how to preserve the materials of construction from the effects of fire. It will not do to say that your house is fire-proof because there is nothing in it to burn. Houses are built for use. You cannot prevent people from putting combustibles into them. Perhaps they are built for offices; but who is to say how much furniture the tenants are to use? You cannot put up buildings for show, and then lay the blame upon the occupants if they are destroyed by fire. Take the case of office-buildings. Under severe scrutiny the accumulation of combustibles in them may be curtailed; but in the course of time other tenants come in, or the buildings are diverted to other uses. Consider the inflammable nature of a well-stocked and somewhat cramped architect's office. Look at the accumulation of cases and books in lawyers' offices, and see our public buildings stored with cases and documents often from floor to ceiling. A tenant may take two rooms, using only one of them for business. The other often becomes a storehouse, and so gradually that the owner is not likely to detect the illegitimate use made of it. Then upper floors are often used for manufacturing which can only be carried on in such structures, such as engraving or lithographing, with their accumulations of combustible materials in places not easily reached by water. Many offices are filled with sample-cases from floor to ceiling, and drawers filled to repletion. I am not supposing that the fire originates in one of these rooms, where it might quickly be stamped out, as was the case lately in the Palmer House in Chicago. But suppose it starts among some boxes accumulated in a basement, perhaps only left there temporarily to be removed in the morning. In the stillness of the night the fire creeps up a stairway or an unprotected elevator, and communicates with a suite of such offices as I have enumerated above, with wooden doors and open transom lights, and doors standing open between the rooms. Before succor comes a whole floor is in flames, and the incombustible yet unprotected materials of construction are in danger. Or, suppose a fire rages on the opposite side of a narrow street, and the wind sweeps the flames into the windows of a number of such rooms simultaneously; the same results will follow.

The sad experience of a few years has shown that the most treacherous and dangerous of these materials of construction is *iron*, the very mainstay and *shibboleth* of fire-proof constructions of ten years ago, and of some at the present time.

As regards floors, there is no instance in which the filling between iron beams has failed before the beams themselves; yet we have been discussing over and over again the various methods of doing this part of the work most effectually, when the vulnerable part has had no consideration. We have plastered the under sides of brick arches, and run elegant mouldings on the iron beams, which mouldings we have had as much as we could do to make stay in place at ordinary times. Some have called this fire-proofing; but a good fire will bring down these plaster mouldings in a few minutes, because they expand and crack, being heavier and thicker than the other plaster, and have adherence only at the edges. We have suspended ceilings beneath the beams and arches, putting an ordinary and cheap coat of plastering on an expensive structure of iron. This is much better. We have here the advantage of a confined air-space between the structure and ceiling. Still the plaster is thin; and if it absorbs enough heat to expand the lathing, by which process it bulges out in places, away goes the plaster, and the laths are of no account as protection to the beams. We have suspended sectional slabs of incombustible and non-conducting materials under the beams and arches at still greater expense, and with the addition of greater weights. This is better still; but it is a double process. What we want is a simple one, which will give a groundwork for the ceiling, and support for the floor, by one operation, and at the same time obviate the necessity of filling up dead space to get up to the proper floor level. Combined with this we want a positive protection for the beams, enveloping them on all sides.

Thus far I think only three methods of constructing really fire-proof floors have been employed. The first is where a flat arch of non-conducting and incombustible material has been sprung between the lower flanges of the beams, the lower surface of the arch being below the bottoms of the beams. When the blocks fit well, and the edges next to the beams slightly cover them, the space between opposite blocks has the form of a dovetail, so that cement filled in for the protection of the beams can never be dislodged. This method is the one employed by the fire-proof building companies of New York and Baltimore, and by other constructors as well; the variations of different manufacturers being in the forms and materials of the blocks employed. With all these methods the ceilings are flat.

The second method is that employed by Mr. William Ward in the construction of his private residence at Portchester, N. Y. It has been fully described in the *American Architect and Building News:* [1] it is therefore unnecessary for me to describe it in detail. As briefly as possible I will say that it is a modification of the French system; but uses Portland cement and sand, instead of plaster and cinders. The beams are incased in a body of concrete, which is first allowed to harden. Ledges are left on the sides of this incasing concrete. At the level of these ledges is set a flat centring, on which is spread one inch of concrete. Then three-eighths inch iron rods are laid from beam to beam a few inches apart; then an inch of concrete; then iron rods crossing those previously laid; then one or two inches of concrete. The incased beams show below the ceiling, and the concrete in the spaces between them forms one homogeneous body with the concrete incasing the beams. Experiments have demonstrated that with this system of fire-proofing fully one half of the iron usually employed in beams may be dispensed with, and that the formulas generally used for determining the depth and spacing of the beams do not apply in such cases. What formula can be used for them has not yet been determined.

The third method of floor-construction is that employed in the Mitchell Building at Milwaukee, and devised by Mr. Loring; the building being designed by Mr. Mix, architect. The beams are incased with porous terra-cotta, there being one block on each side, the two meeting at the under side of the beams. These are set with gauged mortar. They form skew-backs. Barrel-arches are not employed; but at intervals of very nearly two and one half feet, solid segmental brick arches are sprung across from beam to beam, the same as would be employed over an opening in an eight-inch wall. This leaves a series of open squares. The brick arches are connected by slabs of hard terra-cotta of cellular form, two feet long, one foot wide, and two inches thick each. The ceiling shows the incased iron beams one way, the segment arches the opposite way, and the panels of hard terra-cotta in the interstices. The surfaces of all the parts are rough enough to receive plastering. This has the advantage of being the lightest construction yet employed when iron beams are used.

For girder protection the case is similar to that of a beam. The girder, however, is often exposed on the sides as well as the bottom, and needs more careful protection as it is more exposed. We find many buildings in which the girders are wholly unprotected. This is the case in the largest jewelry house in New York. In most instances the girders are either incased with wooden furring and laths, plastered in the ordinary way, or with iron laths similarly plastered. These, as far as protection goes, are quite as imperfect as the same process applied to ceilings. I have been informed that in some buildings girders have been enclosed with flat slabs of non-conducting and incombustible material. I do not know of any in which they have been buried in a solid envelope of non-conducting and incombustible material, except the Mitchell Building at Milwaukee. For this porous terra-cotta blocks have been cast to nearly fit the beams forming the girder, the blocks having straight exterior lines. The slab forming the bottom is bedded up against the girders, and the side pieces hold it after the manner of a dovetail. The side pieces have bearings on the bottom flanges of the beams forming the girder. The whole is held together in a solid mass by the gauged mortar in which the terra-cotta is set, which fills all the interstices between the girder and the porous body. Plastering is applied directly to the porous body. There is a wide range of materials which can thus be applied to the protection of girders, varying however in non-conducting properties and weight.

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[1] See Vol. II. p. 266.

In the older government buildings, isolated supports, such as pillars and columns, were either of brick, stone, or marble. These were used indiscriminately, on the supposition that they were incombustible and consequently fire-proof. Stone and marble seem only to have been used in preference to brick where richness of effect and a slight decrease of dimensions were sought. It is needless for me to call your attention to the imperfections of stone, granite, or marble as materials to resist fire in the interior of a structure. Where the room can be spared and sufficient strength obtained, brick will ever remain one of the most efficient fire-resisting supports. It is weakened in this respect, however, by the insertion of stone, marble, or granite bands. Where such are necessary, plates of cast or wrought iron should be employed. They may be very thin, and the amount of heat absorbed by them can do no harm. Iron bands are useless to prevent the crushing of brick piers or arresting its progress, especially when the loads are central.

Thirty years ago cast-iron came into use for isolated supports, the first columns having been imported from Scotland. They may now be seen at the corner of John and Pearl Streets, New York. Strange to say, all the columns then imported were not used at that time, but twenty years after were employed in another building. The use of cast-iron for columns is now almost universal, and many in our profession have made their first concessions of their sense of architectural propriety to practical convenience in using them for fire-proof structures. It is not many years since the danger to be apprehended in the use of iron for columns, whether cast or wrought, became apparent. It seems to have been perceived in England before it was in this country. A cast-iron column expands considerably before it becomes sufficiently heated to be materially weakened. The expansion is very nearly one twelfth of an inch to a foot, or one inch in twelve feet. It forces the superimposed load upward, and thus not only lifts the work, but is resisted by all the rigidity of the work; this brings a strain on it that it was not calculated to bear, and it breaks as soon as it is softened in the least. It would stand a greater heat with safety if the load was not thus increased. If water is thrown on it, the nearest side contracts; it bends, and the load, bearing on a curved support, breaks it, no matter what the coefficient of safety may be. It does not fly to pieces, as some suppose, on account of the action of water alone. It snaps off on account of the weight, even if moderately heated. If heated to the softening point, which is very nearly the melting point, it flattens and bends over. I have seen many of them with one end entirely melted off. It will thus be seen that it is not only necessary to prevent columns from melting, but to keep them from expanding. The expansion is a greater element of weakness in columns than in any other part of a building. England was first awakened to the necessity of protecting iron columns by the destruction of the Pantechnicon, a supposed fire-proof building, which contained many of them. The necessity for protecting them in fire-proof buildings of all classes became apparent to the writer on seeing the destruction of the Chicago Custom House in 1871, due alone to the weakness of the iron columns on the first story. I had occasion to give some account of the destruction of this building, in this very place, six years ago.

Dennet was the first to propose a method of protecting cylindrical cast-iron columns. He surrounded them with two and one half inches of Portland cement, which was plastered around the columns after they had been wound with spirals of iron wire. This increased their diameters five inches, and made them quite bulky. He tried some interesting experiments with actual fire; placed thermometers inside, and suspended fine strips of lead in them, to show that they would not melt. A double iron column has been used in New York for some years. The space between the cylinders is filled with plaster of Paris. An iron contractor told me that they were liable to burst in frosty weather, and consequently they put in the plaster in a dry powdered state. In case of the destruction of the outer shell by fire, which is most likely, the dry plaster is liable to fall out, and the supporting column becomes exposed. These columns are heavy and expensive. The method of combining iron with a non-conducting and incombustible material, calculated to resist heat, and at the same time receive an incombustible covering having a superior exterior finish to that of iron, invented by my then partner and myself a few years since, was the result of our observations of the effects of fire on the old Chicago Custom House. This is too well known to require extended description in this paper. It has been employed in the Mitchell Building before mentioned. The various methods described are the only ones known to have been employed up to the present time for the protection of floors, girders, and columns.

Partitions, if required to be light and otherwise than of common brick, do not present the difficulties which surround the architect in considering the floor question. Many materials useless for floors may be good for partitions. Of those not generally known to the profession, but worthy of notice, may be mentioned that of James John of Chicago, and such as was employed by Mr. Ward in his house at Portchester. Mr. John strings heavy wires (about No. 10) from floor to ceiling four inches apart, and sets up boards one inch from the wire-work. He then throws gauged mortar against the boards until it is two inches thick, thus leaving the wires in the centre. He levels his work off, removes the boards, and thus gets a solid partition of two inches. Mr. Ward made similar partitions of the same thickness by setting up three-eighths inch iron rods, and filling in with Portland cement concrete in the same manner. Besides these materials porous terra-cotta bricks, as employed in the Mitchell Building, hollow bricks, or any of the manufactured building blocks containing hydraulic lime, make reliable partitions four inches or more in thickness, and not requiring any extraneous stiffening.

Roof-construction does not need consideration here, because the problem is the same as floor-construction. Iron truss work for roofs must receive as careful attention as girders or columns. It is well to remember that the trusses of the Patent Office roof were entirely made of iron.

With regard to the aspects of the fire question from the point of view of fine art, a new field for thought must be traversed. If we cannot reconcile these new methods to our preconceived ideas of artistic propriety, it seems to me that in the present exigency we would be recreant to the evident demands of necessity, were we to sacrifice the former or attempt any compromise with the latter. The present state of affairs only shows that the problem of fire-proof building is not yet fully solved in all its aspects. The student of art has a new problem before him. The reconciliation must come when we know more than we now do. It would be foreign to the purposes of the present discussion to make any suggestions bearing upon it. It concerns us now to be alive to the necessities of the moment; to avoid all methods of fire-proofing which have failed to stand tests, whether experimental or drawn from experience; to avoid expending our clients' money on methods of building which only hold forth false promises to those who confide in us; to consider diligently the contingencies of danger which may arise in every case; and to carry on scientific investigation until the end demanded is accomplished. It will not do to say that the case is hopeless. The world will only laugh at us if we do. We may expect to hear such things from the unlearned, but opinions from such sources will not have the weight which attaches to the dicta of scientific investigators.

HEAT AND VENTILATION.

I.

[A paper read at the Eleventh Annual Convention of the American Institute of Architects, by Carl Pfeiffer, F. A. I. A.]

It may have appeared rather fanciful, and arising more from æsthetical than practical considerations, when Mr. George A. Shove, a couple of years ago, proposed, in substance, the erection of glass (or at least mainly glass) dwellings for all those of our race who live on "the shady side of the fortieth parallel of latitude,"—though I am not quite certain whether the same principle of constructing glass dwellings might not be applied to the people who live on "the sunny side" of that parallel with the same results, if proper cognizance be taken of the various colors of light. In other words, since glass transmits light,—and Mr. Shove's ingenious conception is based altogether on that power of transmission,—it might very probably be possible to erect a certain class of glass dwellings for the more northern climate of the earth, which would transmit, in gradation proportionate to particularly temperate locations on the globe, the heat rays of light; and another class of glass dwellings for the southern climates, which would rather exclude in the same proportion those heat rays. At any rate, the main idea of Mr. Shove's proposition is one which all architects must recognize as valid, namely, that in order to secure a healthy and comfortable existence for the human race it is necessary to construct, or at least make possible "the construction of an artificial climate" in every part of the globe.

For controlling the immediate effect of the temperature of the air upon our bodies, and for effecting a proper relation between the out-door temperature and ourselves, we must rely, of course, upon the tailor, who chooses the quality of the garments we wear and their special construction; but for our in-door life it is incumbent upon the architect, considered from a purely practical point of view, apart from his special character as an artist. It is on him that we must rely for the quality of the material wherewith we erect our houses no less than for their proper construction. The Esquimau very properly dresses in furs and lives in snow houses; in our climate we live in houses of brick or wood, and dress differently with every change of temperature; and for the equatorial regions there is as yet no proper style of clothing,—absence of clothing being purely negative,—and no adequate style of buildings has as yet been invented for those regions, so far as I know. As for the fanning by slaves which is practised in the tropics of the West India Islands, or the fanning by machines in East India, it is, after all, a very unsatisfactory contrivance to produce an artificial ventilation, and has, moreover, no relation to the science of architecture. And yet I am very sure that in course of time the inhabitants of the tropic regions will also be able to obtain an artificial climate as well as we of the temperate zone, or as the inhabitants of the arctic zone.

We architects, however, of the temperate zone have, as I have before suggested, a most difficult problem of our own to solve, in that we have to determine the best construction for a special locality. We must therefore know the temperature of the climate, the geology of the place upon which the building is to be erected, the composition of the materials near at hand for the construction of the building, the changes of weather likely to take place; and all this not as architects proper, not as creators of works of purely artistic beauty, but in that character of architects which unites our profession so closely to that of public health. To a large extent, every architect should look upon himself as a physician. This, from obvious reasons, applies especially to cities, where architects are most in requisition, and where many co-operating causes demand from them not only the creation of an artificial climate, but along with it the furnishing of a perpetual current of pure air tempered to that climate. He must see to it that the house which he builds be so arranged that not only the temperature of the air in it can always be regulated, — at least to such a degree as advancing science enables us to do, — but also that the air be always fresh and pure. In its sanitary character architecture must, therefore, look to the combination of heat with pure air or ventilation; and the problem is, by what means can we best obtain in our variable climate a constant supply of pure air heated or cooled to the necessary temperature? We architects are responsible for the solution of this problem, and this responsibility increases in proportion as men in these days have to live more of their day in dwellings, — a mode of living which must always increase with the increase of manufactures, commerce, and other industries.

Let me illustrate the vastness of this responsibility of architects as sanitarians in the construction of every kind of building, whether made for human beings or for beasts, and whether it be a private dwelling or a public building, a court-room, a hospital, an insane asylum, a church, a jail, or a prison, by an old but unhappily o'er-true tale, — The Black Hole of Calcutta.

The most noted instance of the deadly character of impure air, resulting from a deficiency of ventilation, is known in history as the Black Hole of Calcutta, but the mere horridness of that example has obscured the lesson it might and should have taught. It occurred in the year 1756, during the rebellion of the East-Indians against British rule, which was finally suppressed by the great Clive, and it may not be improper to recount the terrible tale before you on this occasion and in connection with the subject on which I am speaking.

Calcutta had been compelled to surrender to the native rebel troops, on the 19th of June, 1756, and its small garrison of five hundred and fourteen men, of whom only one hundred and seventy-four were Europeans, had been taken prisoners. One hundred and forty-six of these prisoners had been driven into one of the dungeons of the garrison, known as the Black Hole, a room of only twenty feet square or one thousand six hundred cubic feet, and with only two small windows, and those obstructed by the veranda. It was the hottest time of the year, and the night was uncommonly sultry even for that season. The excessive pressure of their bodies against one another, and the intolerable heat which prevailed as soon as the door was shut, convinced the prisoners that it was impossible to live through the night in this horrible confinement, and violent attempts were immediately made to force the door, but without effect, for it opened inwardly; upon which many became violent. Mr. Holwell, who placed himself at one of the windows, exhorted them to remain composed in both body and mind, as the only means of surviving the night; and his remonstrance produced a short interval of quiet, during which he applied to an old Jemantdar, who bore some marks of humanity about him, promising him one thousand rupees in the morning if he would separate the prisoners in two chambers. The old man went to try, but returning in a few minutes said it was impossible, when Mr. Holwell offered him a larger sum, on which he retired once more, and returned with the fatal sentence that no relief could be expected, because "*the Nabob was asleep, and no one dared to wake him.*" In the mean time every minute had increased their sufferings. The first effect of their confinement was a continued sweat, which soon produced intolerable thirst, succeeded by excruciating pains in the chest, with a difficulty in breathing little short of suffocation. Various means were tried to obtain more room and air. Every one stripped off his clothes, every hat was put in motion; and, these methods affording no relief, it was proposed that they all should sit down at the same time, and, after remaining a little while in this posture, rise all together. This fatal expedient was thrice repeated before they had been confined an hour, and every time several, unable to raise themselves up again, fell and were trampled to death by their companions. Attempts were again made to force the door, which failing as before redoubled their rage; but the thirst increasing, nothing but "Water! Water!" became soon after the general cry. The good Jemantdar immediately ordered some skins of water to be brought to the windows; but instead of relief his benevolence became a more dreadful cause of destruction, for the sight of the water threw every one into such excessive agitations and ravings that, unable to be regularly served, each man battled with the utmost ferocity against those who were likely to get before him, and in these conflicts many were either pressed to death by the efforts of others, or suffocated by their own. This scene, instead of exciting compassion in the guard without, only awakened their mirth, and they held up lights to the bars in order to have the diabolical satisfaction of seeing the deplorable contention of the sufferers within, who, finding it impossible to get any water whilst it was thus furiously disputed, at length suffered those who were nearest the windows to convey it in their hats to those behind them. It proved no relief to their thirst or other sufferings, for the fever increased every moment with the increasing depravity of the air of the dungeon, which had been so often respired and was saturated with the hot and deleterious effluvia of putrefying bodies, of which the stench was little less than mortal. Before midnight, all who were alive and had not inhaled air at the windows were either in lethargic stupefaction or raving with delirium. Every kind of invective and abuse was uttered, in hope of provoking the guard to put an end to their miseries by firing into the dungeon; and whilst some were blaspheming their Creator with frantic execrations of torment and despair, Heaven was implored by others with wild and incoherent prayers, until the weaker, exhausted by these agitations, at length lay down quietly and expired on the bodies of their dead and dying friends. Those who still survived in the inward part of the dungeon, finding that the water had afforded them no relief, made a last effort to obtain air by endeavoring to scramble over the heads of those who stood between them and the windows, where the utmost strength of every one was employed for two hours, either in maintaining his own ground, or in endeavoring to get that of which others were in possession. All regards for compassion and affection were lost, and no one would recede or give way for the relief of another. Faintness sometimes gave short pauses of quiet, but the first motion of any one renewed the struggle through all, under which ever and anon some one sunk to rise no more. At two o'clock not more than fifty remained alive; but even this number was too many to partake of the saving air, the contest for which and life continued until the morn, long implored, began to break, and with the hope of relief gave the survivors a view of the dead. The survivors then at the windows, seeing that their entreaties could not prevail on the guard to open the door, it occurred to Mr. Cook, the secretary to the council, that Mr. Holwell, if alive, might have more influence to obtain their relief; and two of the company undertaking the search discovered him having still some signs of life, but when they brought him near the window every one refused to quit his place, excepting Capt. Wilks, who, with rare generosity, offered to resign his, on which the rest likewise agreed to make room. He had scarcely begun to recover his senses before an officer, sent by the Nabob, came and inquired if the English chief survived, and soon after the same man returned with an order to open the prison. The dead were so thronged, and the survivors had so little strength remaining, that they were employed nearly half an hour in removing the bodies which lay against the door before they could clear a passage to get out one by one, when, of one hundred and forty-six who went in, no more than twenty-three came out alive, — the ghastliest forms that ever were seen on the earth. The Nabob's troops beheld them and the havoc of death from which they had escaped with perfect indifference, but did not prevent them from removing to a distance, and were immediately obliged, by the intolerable stench, to clear the dungeon, whilst others dug a ditch on the outside of the fort, into which all the dead bodies were promiscuously thrown.

This horrible tale, gentlemen, told by Mr. Holwell himself, and which at the time of the occurrence of the terrible tragedy and ever since, whenever it has been repeated, has made the human heart shudder at the notion of the ferocity and cruelty whereof the human heart is capable, — is it not, in point of fact, merely a counterpart to the (though it be unconscious) cruelty of the men and women of our time, who shut each other up, in most city dwellings at least, in rooms that are Calcutta Holes, and who, which is saying still more, shut out with special wilfulness from every new-born child the pure air of God? Almost every nursery in the land is a miniature Black Hole of Calcutta, as the tables of infant mortality but too commonly show. We take away from these little infants light and air, — that is to say, heat and ventilation. Light is heat and combined with air creates ventilation; and yet we wonder why infants should die at such a fearful rate, — about five to one, I believe, as compared with adults. We carefully curtain thickly every window of the room wherein the infant passes its first weeks, which is almost as cruel as was the action of the British government in imposing a window tax whereby the poor and penurious were induced to close up as many windows as possible in their houses, thus killing themselves in order to escape a ridiculous tax. We place our prisoners in cells from which air is as carefully excluded as light, allowing each prisoner, on an average, throughout the United States, I believe, from three hundred to four hundred cubic feet of air in his cell, with almost no ventilation and with no light, but gracefully pay the hospital bills which are the result of this treatment. If a prisoner, moreover, proves refractory, or makes himself objectionable in some way or other to his superior, we do still worse: we shut him up with seven or eight others in a cell of the same dimensions, namely, one containing from three hundred to four hundred cubic feet, — a cell carefully guarded against the admission of light or air by thick iron doors, — and keep them there standing, since they cannot possibly lie down, for twenty-four hours and sometimes forty-eight hours, often, I believe, for even a longer time. This cruel, pernicious, and at the same time — while we consider it economically — expensive system of keeping out heat and ventilation from rooms bears not only upon the criminal or unfortunate classes of our society, but bears equally upon the condition of our poor. Whole families of our poor often have to stay in one room, eating, sleeping, cooking, in the same place many times for a whole winter, without receiving any ventilation through the windows. And the door of the room must not on any account be opened, since people suppose that with the passing out of the foul air of the room the warmth will also pass out. The fallaciousness of this proposition I have already shown in a former paper. It is the *fresh cold air* from the outside which has the *elements of heat* in it, whilst the *foul air of the inside* turns into a *deadly coldness* after a short time. It is true that the inmates of these rooms are not always found suffocated next morning, but the whole process is like unto one of gradual strangulation; and if it does not result in immediate death, it results at least in the probably far more hideous phenomenon of perpetual weakness and physical unfitness for life. It may be very poetical when our great German poet Schiller sings, —

"Room is in smallest cottage
For a happy, loving pair,"

but, gentlemen, it is not the fact. There is not room enough in a cottage of say from five hundred to even one thousand cubic feet for two grown persons; much less, I should say, for "a happy, loving pair." Hence it was a great progress, in regard to this special matter, for the people of Germany when the Prussian income tax was extended all over the German states, for in some of those states it had been the law before to tax people according to the size of their rooms or habitations, judging from them the wealth of the inhabitant. This law was quite as obnoxious as the English window-tax law, and had indeed the same effect, since, while the latter compelled, or, if you please, induced people to reduce the number of their windows, and thus made habitations less wholesome by excluding light, the former tended to make people build their rooms and dwellings generally smaller, and thus make habitations less wholesome by excluding the possibility of ventilation. We may congratulate ourselves that the laws of our country throw no such difficulties in our way, and that, therefore, we architects have only to deal with the irrational objection current amongst so many people to pure air in general, and the necessity of supplying pure air to all people in some form or other.

In regard to this irrational objection, let me quote from a somewhat celebrated work, "Liberty and Law," by the Hon. Britton A. Hill, of St. Louis. He says: —

"Every species of intoxication imparts a fondness for the condition, a desire to recur to the sensations excited by it; and the intoxication produced by foul air is not without this dangerous element, which, indeed, alone can make it possible that men shut out from their dwelling-places God's pure air, as if it were their worst enemy, and yield themselves and their children up to those sensations of drowsiness and stupor which air impregnated with carbonic-acid gas invariably excites. Legislation on this subject will, therefore, meet a deep-rooted opposition from the frequenters of dens, cellars, etc., but in proportion as this opposition has its origin in that same foul air, the law should protect the upgrowing generation from similar results, and make possible the raising of a new generation of children, whose bodies shall be free from the fearful taint."

Permit me also to call your attention to these memorable words, wherein he enwraps, as it were, his whole system of public hygiene: —

"It is the duty of the government to provide pure air for every person, and thus protect each from the contaminating influences of all kinds of miasmatic and other impurities.

"The legislative power in each State must regulate:

"(1.) The laying out of cities and villages in such a manner as to make possible the needful ventilation of their buildings, and providing public drainage.

"(2.) The construction of all private as well as public buildings in such a manner as to make accessible to every inmate the necessary quantity of pure air, and the establishing of private drainage.

"(3.) Personal cleanliness.

"(4) The laying out of counties and townships.

"To provide, furthermore, all other kinds of food and drink for the human body in the natural condition of healthful purity, the legislative power in each State must regulate: —

"(1.) The sale of all food and drinks consumed by man, so as to secure them to the consumer in their unadulterated purity.

"(2.) The preservation of the health of all animals, birds, fishes, and the soundness of all vegetables consumed by man."

This is surely going all the length of sanitary science, and hence we do not need to follow it up, merely reciting it to point out the many and intimate relations that constantly occur in life between the architect and the physician; just as such connection occurs so frequently between the artist and the architect, and the landscape gardener and the architect. In reading closely works of ancient architecture, it seems almost as if some of the most treasured of its characteristics had arisen purely from hygienic considerations.

RELIGIOUS ARCHITECTURE.

[Papers read at the Eleventh Annual Convention of the American Institute of Architecture, by Mr. C. C. Haight, F. A. I., and the Rev. J. H. Hopkins.]

In all countries, in all ages, religious devotion has found its expression in magnificent buildings.

In our own day, in our own country, the desire to be original, the desire to develop a new style, has produced anything but satisfactory results. In the last few years our architects have devoted much time to the study of the theatre, but little to the study of the best ecclesiastical architecture. In their desire to make our churches comfortable they have devoted all their energies to the perfection of the plumbing and the softness of the cushions, and so have left themselves but little time to think of the beauty of holiness. I do not wish to undervalue the importance of light and fresh air, of seeing and hearing, but I do think that, important as these things are, there are other matters connected with church building that we ought not to leave undone.

Our churches are almost universally built in what is popularly known as the Gothic style of architecture. It is much to be regretted that there is such a thing as bad Gothic, and that it appears with us to be such a universal complaint. In the city of New York, we have only one church to which we look with pride, one church that stands without rival as the embodiment, the expression of religious sentiment; and yet Trinity Church is but an imperfect reproduction of a type common to many of the beautiful parish churches of England. Accepting this as a fact, and I think few good judges will be found who can deny that this church, built thirty years ago, has in this country no equal, in spite of its defects, no superior in its architecture and in the impression that it conveys, we are naturally led to the conclusion, which I would desire to impress as strongly as I can on my fellow-architects, and especially on the younger members of our honorable profession, that before entering upon the practice of ecclesiastical architecture we should study carefully, and as far as possible master, the architecture of the churches of England built in the thirteenth and fourteenth centuries. I believe that if we will faithfully follow this plan, we shall create in the future churches far more creditable to ourselves, far more satisfactory to others.

I believe, moreover, that before we can succeed in rivalling the religious architecture of past ages we must get rid of the wretched utilitarian idea that our churches are mere preaching-houses; and that until we realize that the church is to be built to the glory of God, that it is his temple, where the faithful come together to worship him, we can hardly hope for success.

CHARLES C. HAIGHT.

SYMBOLISM THE LIFE OF RELIGIOUS ARCHITECTURE.

There can be no true architecture without a thorough adaptation to the purpose for which a building is erected. The Colosseum perfectly expresses its object, — the enabling of 80,000 to see the public shows, and the size and costliness of the edifice embodied the vast importance of the Circenses, as indispensable to the popularity on which the pagan Roman Empire rested. The Quaker meeting-house is equally expressive of a religion which thinks to arrive at pure spirituality by leaving nothing external except what is bald, bare, and if possible drab. The old Roman basilicas express perfectly the fact that the forms of pagan architecture were now occupied by a new and conquering spirit, — the spirit of Christianity, — which was moulding the old elements into new forms and meanings. The Byzantine style shows the further progress of this spirit, until the old forms, lifted to their utmost height, could develop no further without losing their identity. Pointed architecture shows the new spirit victorious over the old, and new-forming every detail, as well as all the great proportions and outlines, into full harmony with itself. The over-luxuriance of the later Pointed expresses the too great wealth and growing corruption of the church, until it found its Nemesis in the Renaissance. And the modern St. Peter's at Rome perfectly expresses modern Romanism, — the imperial dome testifying to the spiritual imperialism which is its essence, and the old pagan ideas of power being once more dominant, notwithstanding all the influence of Christianity in ground plan, elevation, and detail, everywhere ennobling the whole.

All other styles of great architecture show the same: Egyptian, Hindoo, Assyrian, Mexican, — every distinct style is so, because of the distinct ideas in the religion which thus takes on its proper outward expression.

Too many of our modern architects run through all the various styles, and pick out the pretty things, using them to garnish their work, without any reason, except to tickle the eye. We have sometimes such a medley of odds and scraps as deserves only the description of "architectural hash."

The first requisite, therefore, for religious architecture is that the architect should thoroughly embrace, and be devoted to, the religion which he undertakes to express in external form. As that religion is a historical religion and has a marvellous history from the Garden of Eden until now, so its architecture has a history also, from the pillar-stone of Bethel and the tabernacle in the wilderness, down to our own day and country. The knowledge of the past, and the consciousness of the imperious needs of the present, must both enter into the production of true religious architecture.

The wondrous triumphs of mediæval architects are thoroughly alive, in every part, with religious symbolism. They always meant something, in every leading feature, and almost in every detail. It is utterly idle for any one to attempt to master their architecture from the outside, and make it a mere grammar of mouldings and tracery and other ornament. The Christian dogma underlies it all. The Trinity in Unity, the Incarnation, the Cross, the Holy Scriptures, the Apostles, the Church, the Sacraments, Death, the Place of Departed Spirits, the Judgment, the Life Everlasting, — all these, together with smaller matters of every-day life, are found embodied in innumerable varieties of form. in the churches and cathedrals which are the wonder of the world, and draw men's hearts even when they cannot tell why. The church edifice must really be the embodiment, in stone, of the spiritual church of true believers, — the living stones of that sanctuary which is Christ's body. Until it become such, we shall properly have no religious architecture. We shall have only unprincipled architectural quackery. The first requisite for a "religious architecture" is to have a religion.

J. H. HOPKINS.

MODERN CHURCH ARCHITECTURE.

The committee who had in charge the preparation of the programme of the late convention of the American Institute of Architects invited the members of the Institute to prepare short papers on the subjects named in the programme. The object of this was to allow time for the discussion which it was though the papers would be sure to evoke. On the subject, "Religious Architecture," the following short papers were read by Mr. R. S. Peabody and Mr. C. A. Cummings, both of the Boston Chapter. Unfortunately the pressure of executive business prevented any discussion of these papers, and the debate was lost.

Mr. Peabody said: —

There is one practice in the building of churches common to France and England, but which is almost unknown here. It is the practice of making them permanent, durable, secure.

A recent walk about London showed me not rare instances, but great numbers of ritualistic churches built for mission purposes, and in a way hardly to be seen here. I have the photographs of many here to-night. The interior walls are brick, the paving masonry of some sort, and the roof vaulted so far as the money holds out. The churches I think of principally are those of Brooks, — severe and monastic in design, and evidently of little cost; but they are durable. I recall a church of Pierson's where this intention was not abandoned for want of funds, for the choir and transept had been built in a rich and costly manner with the early English detail of which he is such a master; and the nave was a long galvanized-iron temporary church.

It is just the same in France. A series of new Romanesque churches have been built in the Menilmontant district. Wood is hardly apparent in these constructions. The walls are stone; the vaulting is sometimes made by turning brick arches without centres from iron vaulting ribs; and the vault is subsequently plastered; the floors are mosaic perhaps, and sometimes covered with a wooden floor beneath the seats.

By these references I wish to note the almost universal custom in other countries; and these churches, many of them, are no more costly than some we have visited to-day.

Every public building, and in just the same way every church of importance, is practically not alone for our day, but an endowment for future generations. It should thus be looked upon, and the universal practice of building churches of a destructible character, while it is unknown in other countries, is unworthy of ours. Take our noblest example, this splendid Trinity; there is nothing to prevent its being destroyed in a night by fire. In England or France it might have no cellar, but it would have masonry floors, probably masonry ceilings, and an interior of masonry; while this has wooden floors, and roof and walls plastered on wooden furrings, and, as I am told, its fittings are too choice to permit its general use by the Convention. I cite it as our noblest example; and our others are like it, — wooden churches surrounded by a masonry wall, and fitted with equally nice furniture. It is useless to talk of cold and echoes. These offer the problems somebody must solve. I submit that a monumental church should be built as an endowed possession for other generations, and rough enough for every use; and that as such, ours are unworthy.

Now, there is one more suggestion which these churches offer. We readily acknowledge the perfection of Mr. Pierson's Gothic churches and others in England. On the other hand, we see in St. Clotilde in Paris, a very lifeless Gothic church, and in St. Ambroise and the other Parisian Romanesque churches equally lifeless examples of round-arched work; while the most perfect of Mr. Pierson's Gothic churches, though it may equal, cannot surpass the nobility, serenity, church-like air of Hittorff's classical basilica of St. Vincent de Paul, or Vaudremer's Byzantine parish church at Montrouge; while the Romanesque that makes so poor a figure in Paris certainly has not diminished the ecclesiastical effect of our own Trinity. From this I argue, that as I believe it to be in domestic work, so I think in church work, the style employed has little to do with the character of the church, but the feeling and ability of the designer everything. I mistrust the Gothic dogmas in church work as much as I do in other work. In fact, with all our accumulated knowledge, I think that the style matters less and less, and the artist more and more, — and this in church as in domestic designing.

In our designing of Congregational churches, we are met by two opposing influences: on the one hand, utilitarianism, — the needs of the parish in the modern order of things; on the other, ritualism, — that returning to the old symbols, customs, and decorations which the Puritans threw aside in sheer opposition, but of which, now that the exigency is past, all sects see the value and pleasure. I shall leave to others to say where this line shall he drawn, and to speak as to the complicated arrangements now required in connection with a modern Congregational church. I confess that I think the architects are too prone to the old ways, and that often, when a Congregational church is wanted, the parish get too mediæval plans, and churches fitted alone for obsolete forms of worship. This, of course, is a wrong tendency, and our chief fault in church building. Obviously, the purposes to which the building is to be put — the present forms of religious worship — must be our guide.

While expounding is the main object, the seats must be arranged accordingly. So long as people practise total immersion as a religious rite, the undesirable but useful force-pump, hot-water boiler, and marble or lead tank, must be a feature in the church. But, with all the changes that have come about lately, — church parlors, lecture-room seatings, cooking-stoves, pantries, and the other adjuncts of a well-regulated meeting-house, — it seems to me that the fact that the auditorium is, to most sects, still a house of worship, is likely to be lost sight of rather than that, in this practical country, these wants should rest unsatisfied, in spite of the architect's backwardness. I distinctly would add every useful feature to the building; but I would strive to keep the church itself, from bottom to top, sacred, and put the adjuncts elsewhere.

It is with pleasure that lately I have heard two Congregational ministers express regret at the custom of placing the minister in the centre of the church, and setting his preaching on the same level with the prayers and Bible-readings, the marriages, christenings, burials, and communions, which might well be distinguished from the first. These were Congregational ministers, and not, as might be supposed, Episcopalians; and whatever may be thought of this particular scheme, it seemed to me to be in the right spirit. On the other hand, a church committee recently pointed to a communion-table, behind a chancel-rail, of the most determined Yankee rococo character, and styling it the altar, explained to us that as the lay members spoke from behind the chancel-rail, and not from the platform, the altar was much in the way, and the proper arrangement was to have it shoved beneath the pulpit, and leave free play for the lay speaker.

It is not for us architects to teach the people religion, but there are æsthetic views which this spirit offends; and on such grounds alone, while admitting force pumps, tanks, cooking-stoves, and pantries to their proper places, I think we should keep in mind and increase as much as possible the idea that the main church is not a church parlor so much as a place of worship.

Mr. Cummings said: —

While the church, as a governing and dominating force, was really held in reverence, its edifices were monuments of its power, and acquired a dignity and grandeur wholly unconnected with their practical use. To-day, in Protestant lands, the church is a shadow, and churches are no longer monuments, but buildings erected for the practical uses of public worship, which grow every year more and more simple, and in which the first necessity is that the words spoken by the preacher shall be clearly heard by all his congregation.

Notwithstanding this change in the conditions, we go on building imitations of the old cathedrals, the monuments of an age when the church service was a spectacle addressed by a ruling priesthood to the senses of a crowd of ignorant subjects.

We must of course discriminate between the religious purposes of Catholic and Protestant forms of worship. A Catholic church has to-day the same requirements which a Catholic church had in the Middle Ages; and the problem presented to the architect of a Catholic church to-day is to produce a building which, in general plan, size, and splendor, will most resemble its predecessors of six hundred years ago. He feels no embarrassment as to characteristics, but simply and frankly turns to his books, and does his best to preserve the traditions of the great days of the church.

But the architect who is to build a church for a Protestant congregation has a different task before him. In his church there are no processions, no spectacles; and though the forms are more elaborate and the conditions therefore somewhat different in the churches of the Episcopal denomination than in those of the Congregational bodies, still there is so much similarity that the points of difference may for this occasion be overlooked.

The meeting-houses of two or three generations ago, of which in this city Hollis Street and the West Churches are remaining examples, although quite innocent of architectural design, at least so far as their interior is concerned, were perfectly adapted to their uses. Small, square, low, with a single broad gallery nearly at the level of the pulpit, with an abundance of light, and with all spaces unobstructed, they met the conditions of a simple Congregational service. It ought to be possible to preserve these virtues, while adding the touch of grace which was all they lacked. But the demon of ambition, entering alike into the souls of architects and committees, has encumbered their successors with great columns which cut off the pulpit from one third of the congregation, has raised high into the air a high-pitched, gloomy roof which absorbs the voice of the preacher as well as the light from the windows, has filled these windows with dark and sombre glass, and made the church so dark that the faithful who enter stumble over their own footstools, and can scarcely find the places in their service-books; has enlarged the size until all feeling of association in worship has disappeared. All this we have done in blind and unintelligent following of the mediæval traditions; and the result is that not only have the churches been unpleasant and unwholesome places for worship, but they have been unsatisfactory even as architectural monuments.

If, then, I am asked what should be the characteristics of church architecture to-day, I should begin by a negative, — they should *not* be the characteristics of cathedral architecture six hundred years ago. Not for us are the cliff-like walls, the mighty towers, the vast and sombre spaces, the dim, echoing roofs, of the great churches of old. Our churches must be *houses* of worship, warm, light, cheerful, and fitted for a service in which not only the priest but the people are to join as equals.

The convenience of such a service would seem to discourage a cruciform plan, except as a modification of the square, for greater ease of construction and greater grace of design. (The Greek cross recommends itself in this sense.)

The rigor of our climate, and the importance of the warming problem, would in large churches diminish the area of glass in the windows. In cities the privacy of the congregation will be less invaded by the noises from the street if the windows are high in the walls, or if the chief light comes from the roof.

In a church where the chief portion of the service consists in the reading and speaking of the preacher, the limit of reasonable size and height is soon reached; hence the ambition which leads beyond this limit is a snare.

These, and such as these, seem to me the essentials in modern Protestant church building. These once admitted, there remains the question as to style and decoration. But it seems to me that here we should be as broad as the diversity of tastes will prompt. That one church should be Gothic, and another Romanesque, and a third Renaissance; that in one vigor should predominate, in another grace; that in one the construction of walls and roof should proclaim themselves in the interior, while in another a screen of plaster should make the interior design and decoration independent of the construction, — all this is but to say that there will be diversity of gifts, but the same spirit. We should not wish all our churches to be cast in one mould. The architect who sets himself heartily to his work, and who is happy in it, will know how, according to the means at his command, to express the seriousness, the reverence, the repose, which should characterize the places which intelligent and Christian men set apart for the worship of God.

FIRE-PROOF CONSTRUCTION.

[A paper by Detlef Lienau, F. A. I. A., read at the Eleventh Annual Convention of the American Institute of Architects.]

THE effort to diminish danger by fire to our constructions is one of the greatest importance, and should enlist the energy and all the solicitude of our profession; and even more so in this country, where the difficulties occasioned by the influences of our climate are indeed vastly greater than in the countries of the Old World, from whence we are apt to take our precedents.

The large conflagrations to which many of our cities have lately been exposed have at least taught us this lesson: that the most destructible of our building materials is wood, and the least destructible brick. We should therefore, as much as possible, discard wood, and instead use brick for our principal building material. Among the many suggestions made after our large fires, there has not been mentioned one system of fire-proof vaulting, especially adapted for warehouses and some kinds of factories, to which I beg leave to draw your attention for a few moments. This system, which is very common in the North of Germany, where it has existed since the Middle Ages, is well worthy of imitation, not only on account of its easy and practical execution, but also on account of its inexpensiveness. This vaulting consists of a series of strong elliptical arches, built parallel to each other across the building at intervals of say ten to twelve feet from centres; the spandrels of these arches are regularly built up to a level, and serve to support flat segmental arches turned between them. As a general thing the cellars in all buildings (dwelling-houses and others) are arched over in this manner; and in storehouses, breweries, distilleries, etc., you often find four or five stories, one above the other, arched over in the same manner. These buildings are built entirely of brick, and are often finished in this manner to the very roof, for which the arches are laid with the proper inclination, and then covered directly with cement, tile, or metal. With stairs of brick, stone, or iron, and enclosed in brick wells, and having doors, windows, and shutters of iron, you have a construction as fire-proof as can be made, particularly adapted to storehouses, factories, or to cellars of dwelling-houses, and one not more costly, if as much, as the more modern system of wrought-iron beams filled in with brick arches. A fire from the outside cannot attack such a building, vaulted over from cellar to garret, and a fire originating inside of it will in most cases be confined to the story in which it started.

Our system of wrought-iron beams filled in with brick arches, or arches of other fire-proof materials, has some great advantages: not the least one is, that it gives more available room on each floor, and that it requires less thickness of walls than the former system of all brick. But it is not as fire-proof, on account of the exposure of the iron to the fire: this danger ought to be overcome.

In order to diminish this danger to the iron beams, a thick coat of plaster of Paris can be stuck to the under side of the beams for protection. For this purpose the arches may be started one half inch below the lower edge of the beams, and this will give a coat of at least one inch thick the requisite support from and attachment to the arches

To protect from the heat the end-beams at well-holes, also iron girders composed of two ⌶ beams, and to give them at the same time an inexpensive finish, I have lately used stout hoop-iron ($\frac{3}{16}$ by $\frac{3}{4}$ inch), stretched and bound tightly and riveted around the beams and girders every eight inches from centres; the open channels at the sides of the beams are then filled in and built up with brick laid in cement. The hoop-iron keeps the bricks in their places till the cement has set; afterwards the sides and bottoms are plastered, and mouldings run on them if desired. If the girder-beams are far enough apart to allow the mason to reach with his hands inside, then the cavity between them is filled in with brick likewise.

This device gives some considerable protection against heat in case of a fire, and has the advantage of not being costly.

For storehouses, factories, etc., where the danger of fire is greater, a good protection to cast-iron colums and wrought-iron girders might be built by enclosing the columns in brick piers. Suppose an 8″ or 12″ column: build an 8″ wall around it; this would make a pier of 24″ or 28″ square. To protect the girders, turn, in direction of the same, from pier to pier 8″ segmental arches 24″ or 28″ wide, the extrados of the same to touch the bottom of the girders; then level up the haunches, and build 8″ dwarf walls on each side of the girders to the top of the same. This will give an excellent protection against fire, and where it is most wanted in these kinds of buildings.

In most cases, a 4″ instead of an 8″ wall would be sufficient; but in extreme cases of storage of inflammable materials the 8″ walls and arches would be necessary.

In all our buildings the effort should be to build with fire-proof materials, that is, with stone, brick, iron, and some of the plaster compounds for partitions and furring. Iron beams, which are the most costly of our materials, should be used as sparingly as possible, and we ought to calculate the strength required at every step of our building operations, so that no more iron may enter into our buildings than is absolutely necessary. In order to economize in the right direction, let us use as little wood as possible.

A French architect completes his buildings with less than one half the amount of wood which we put into ours in the way of finish. The less wood we have in them, the less danger of compromising them in case of fire.

In the matter of roofing, there exists on the Continent of Europe a very safe kind of tile, which might well be adopted here. Not that new fancy tiling that has lately been introduced, and is not good for our purpose. The tile I mean is a plain rectangular tile, with a hook at the top to hook behind a wooden or iron lath, 13 or 16 inches long, 6 or 6½ inches wide, with a thickness of half an inch, which is laid 3 thick in mortar, showing 4 or 5 inches to the weather, and rendered underneath with cement or mortar; in other words, it is laid like slate. This tile roof can be laid at a pitch of three to four inches to the foot, and is not only a great security against fire, but also, when of the proper materials, a very lasting roof. When the sparing use of iron is advocated above, it is for the reason of reducing the cost of the iron construction, and in order to popularize the same. And that this can be done there is no shadow of a doubt. To put the beams as wide apart as their more or less length of bearing requires, would in many cases reduce the weight of iron to a very considerable extent.

The more we do in this direction, the nearer we come to the period when we can expect to have structures which will stand with credit an attack of fire from both the inside and the outside of the building.

ANTI-FIRE CONSTRUCTION.

BY R. G. HATFIELD OF NEW YORK.

One of three indispensable requirements of architecture is stability, — permanence.

And yet, of all the buildings ever erected, how few still remain!

Even that achievement of engineering skill, the Eddystone Lighthouse, which has bravely resisted the power of the Atlantic for one hundred and twenty years, is at last undermined and must fall.

The elements in their unceasing action sooner or later triumph over the proudest works of man.

Of the elements at work in this destruction there is none so active, so successful, as that of Fire. With what fiendish relish does it lick up the combustible, and ruthlessly tumble the residue in shapeless ruin! History teems with its work of desolation. The cities of the Old World have all sadly suffered by its ravages: I will mention only one.

The great fire of London, in 1666, burnt for three days, destroying 13,200 houses, including many fine public buildings. The loss by this fire, if computed by present values, would amount to at least $100,000,000.

The city of New York has suffered by at least three great fires. One in 1835 destroyed six hundred warehouses, which together with contents were worth $20,000,000. Another in 1839 destroyed property to the amount of $10,000,000, and a third in 1845 destroyed three hundred stores and dwellings valued at $6,000,000. Charleston in 1838 suffered by a fire which destroyed 1,158 buildings, covering one hundred and forty-five acres. Pittsburg in 1845 lost 1,000 buildings by fire, valued at $6,000,000. Albany, N. Y., in 18— lost in steamboats and buildings $3,000,000. St. Louis in 1849 lost $3,000,000 in steamboats and buildings. Philadelphia in 1858 lost three hundred houses. In 1845 two thirds of the city of Quebec, comprising 2,800 houses, was swept away by fire. The city of St. John, Newfoundland, repeatedly damaged by fire, was nearly all destroyed in 1846, when 6,000 people were rendered homeless. Troy suffered severely in 1862. Portland in 1866 lost $9,000,000, including the loss of 1,600 buildings. Chicago in 1871 and Boston in 1872 were devastated to the extent of more than $200,000,000, and quite recently a devastating fire has almost entirely destroyed the city of St. John, New Brunswick.

But these marked fires do not alone measure the work of destruction: much is due to the smaller fires, which make up by their frequency what they lack in proportions. Constantly at work, little by little, year by year, the aggregate of ruin they accomplish is fearful.

A record kept by the New York Insurance Chronicle shows that the losses by fire in the United States and Canada in 1876 was $75,000,000, and in the previous year it was $86,000,000. This record is doubtless trustworthy, as far as it goes, but I am assured by competent authority that the loss during the last ten years has not been less than $100,000,000 per annum, not including the two extraordinary fires of Chicago and Boston.

What a fearful havoc! Is there no remedy?

The losses in the United States and Canada during the last twenty-five years aggregate an amount which would have sufficed to have rendered all the buildings approximately fire-proof.

A few figures will show this: the United States census for 1870 gives the value of the real estate of the country, but does not give the value of the buildings separately. This, however, may be approximated. From an estimate made upon the property within certain limits of the city of New York, the value of the buildings was found to exceed considerably the value of the ground. The buildings in the rural districts, however, are of much less value than the land, perhaps not half. A fair average for the two — city and country — would perhaps be, to estimate the value of buildings at one third of the whole value of the real estate.

The census for 1870 puts the value of the real estate at about $9,900,000,000, one third of which (if this be the proper portion), or $3,300,000,000, then, is the value of the buildings.

This result may be tested by estimates upon another basis: It is shown in the last Report of the National Board of Fire Underwriters, p. 27, that the insurance effected during the last five years averages about $5,170,000,000 per annum; and it is shown by the records of the New York Chronicle that not more than half of the losses by fire are covered by insurance; hence the $5,170,000,000 insured is only half of the insurable property of the country; or, that the value of the property of the United States and Canada, liable to loss by fire, is not less than $10,340,000,000. This is the value not of the buildings alone, but of the buildings and their contents. To ascertain what portion of this is invested in buildings: It is shown by the New York Board of Fire Underwriters in their last Report, p. 23, that in an average of the losses for the past eighteen years, the portion on buildings was about one third of the whole. Taking this as authority in the matter, one third of $10,340,000,000 is $3.447,000,000 for the value of the buildings in the United States and Canada; which cannot be far from $3,300,000,000 for the United States alone, as before shown. Of the $100,000,000 annual loss, one third may be taken as that which was invested in buildings, and had the buildings been of a character to resist the flames, a large part, perhaps two thirds of the loss upon their contents, would have been saved; thus one third in buildings and two thirds of two thirds, or four ninths of the contents, or together seven ninths of the whole loss, could have been avoided by having more perfect buildings; or, of the $3,447,000,000 invested in buildings, there is an annual loss of nearly $78,000,000 due to deficiencies in buildings. This is more than two per cent of the value of the buildings, an amount which would in twenty or twenty-five years be ample to render all our buildings approximately fire-proof, and would not only save more than three fourths of the present loss in material, but that which is caused by interruption to business, and, in many instances, avoid the loss of life and consequent distress to survivors.

Painful instances of loss of life by fire through deficient buildings are still fresh in our memories. The Brooklyn Theatre and the St. Louis Hotel cry aloud for reform in building. Whatever may be said of the inexpediency of expending money upon ordinary buildings to avoid damage by fire, there certainly is no good reason why, at whatever cost, places of public resort should not be made safe. As life is more precious than money, so no money should be considered wasted which is required to protect life.

It was lately shown in the Chicago *Investigator*, that no less than one hundred and fifty-six theatres have been burned in the United States since the year 1800, and of these, one hundred and nineteen were burned since 1850. Similar statements, though perhaps not quite so disastrous, might be made of hotels and other public buildings. The government of a country should be held responsible for life sacrificed in this manner, as well as for those who die by neglect of sanitary precautions. The owners of buildings of public resort should be compelled by rigid law to render their property secure from destruction by fire.

In the construction of buildings, the materials most in use are brick, stone, iron, and wood. Brick, above all others, is that which possesses fire-resisting qualities in the largest degree. It has been in use from the earliest ages; it is prominent among the materials of ancient buildings.

The Pantheon, the only entire antique building of Rome, is of brick. The marble with which the brick walls were incrusted has long since disappeared. The metal which covered the roof was stripped off for other use. The only opening for light, the eye of the dome, nearly thirty feet in diameter, has been uncovered, exposing the interior to every storm, and during the nineteen centuries of its existence it has been subject to repeated conflagrations resulting from the wars which so often desolated Rome; and yet, through all these vicissitudes, the Pantheon remains in such good condition to-day as to serve as one of the churches of the city Its durability, however, is due not alone to the character of the material which it is constructed, but to its form, the strongest known, a cylinder.

Stone, though inferior to brick, is far superior to iron in its fire-resisting qualities. Granite when exposed to intense heat will crack and splinter freely; marble is quickly reduced to lime; sandstones disintegrate. Only those stones which are of volcanic origin may be safely trusted in the fire.

The extensive use of *iron* as a material of construction is of recent date. Fifty years ago it was but little used. One of the principal reasons for introducing it was its *fire-resisting* character. Gwilt, in his Encyclopædia, page 494, article 1767, edition of 1842, in speaking of iron, says, "The security afforded, not only for supporting weight, but against fire, has of late years very much increased the use of it and may in many cases entirely supersede the use of timber." The experience of recent years, however, especially at Chicago and Boston, has materially lessened confidence in its fire-resisting character. Indeed, its power to sustain weight, when subjected to great heat, has been shown to be quite limited. It is capable of sustaining, in an intense fire, neither compressive, tensile, nor transverse strain, to any useful degree. Its untrustworthiness was shown at least two hundred years ago, for Evelyn says of the great fire of London in 1666, "The vast yron chaines of the Cittie streetes, hinges, bars, and gates of prisons, were many of them mealted and reduced to cinders by y^e vehement heate."

To protect hollow iron columns it has been proposed to secure the passage of a current of air through them. An experiment to test this was made upon a one and one half inch pipe, which was subjected to heat at the middle, while a strong current of air was maintained through it. It was pulled apart by hand in four minutes after the fire was applied.

All metals transmit heat rapidly, a fact which may account for the rapid loss of strength in iron when subjected to fire. If iron be used for floor-beams, arch-ties, or for posts, or for any purpose which exposes it to strain of any kind, it should be protected by an encasement in some slow-conducting material, such, for example, as brick, terra-cotta, or gypsum, although this latter material is active in rusting iron, and therefore should not be allowed to come in contact with it. Where gypsum is to be used a good coat of lime whiting previously applied to the iron will protect it from the action of the plaster. Mr. Hornblower, architect, of Liverpool, has patented a system of protection to iron beams by means of earthenware jackets and concrete, and Mr. P. B. Wight, of Chicago, Fellow of the Institute, has patented a system of protection to iron columns by an enclosure of plaster. These and other systems of protection are just as many concessions to the now well-established fact, the non-fire-resisting character of iron.

Of the four principal materials used in construction, wood is generally supposed to be that which has the least power to resist fire. This idea, in general, is correct, and yet under certain circumstances wood will resist fire longer than iron.

When a building is on fire, known to have supports of iron, firemen are reluctant to enter, while they hesitate not to enter a burning building having wooden supports, at least until some time after the commencement of the fire.

This apprehension of danger from iron supports, the growth of experience, plainly proves the superiority of wood over iron as to a fire-resisting quality.

The late fire at Washington burned a part of the roof off of the Patent Office. It was arrested in its downward course by what was supposed to be a fire-proof floor of rolled iron beams and brick arches, but which subsequently was found to be of wood.

A floor of wooden beams, placed apart in the usual way, has but little fire-resisting quality. The fire, aided by a free current of air between the beams, rapidly consumes them, as so many pieces of well-placed kindlings.

This defect in the construction of wooden floors has led to various devices, one of which is the use of plaster or gypsum, which is thickly spread upon the lathing at the bottom of the opening between the beams, and also extended up on each side. This forms a good filling, effectual in preventing the draught of air, but it has been found to induce rapid decay of the timber, and is therefore a failure.

In the use of ordinary deafening, concrete, plaster, or any similar filling, it is requisite to increase the size of the floor timbers sufficiently to sustain safely the weight of this filling. The fillings above named are a dead weight upon the floor.

If some filling be used which would sustain itself, such, for example, as wood, or if the intervening spaces be filled with so many additional floor-beams, these would not only sustain themselves, but would contribute to the general strength of the floor, or the floor not needing additional strength, the beams could all be reduced in depth to the required limit of strength. An arrangement of this kind produces what is termed a solid timber floor, upon which, there being no interstices for the passage of air, the fire, retarded, acts only in slowly charring the under surface. Such a floor would resist the action of fire for many hours, and would be effectual in preventing the spread of fire.

But wood is subject to decay, and for this reason is inferior to iron, which is deteriorated by rust, generally in a very small degree. Where iron can be protected from injury by fire, it is far superior to wood. For general building purposes, however, wood, if protected from decay is superior to iron. Our want now is some effectual, ready method of preventing decay in wood. Until something better is offered, floor-beams and posts may be subjected to the kyanizing or burnetizing process, which are claimed to be effectual. It has been proposed after wood is kyanized, to coat it with silicate of soda as a protection from fire. Experiments on a large scale in this direction are desirable, and might well be undertaken by the general government at Washington.

Investigations lately made show that the archives of the War Department are exposed to destruction by fire, being lodged in buildings of a frail nature.

Self-protection may possibly inspire the authorities to make the indicated tests of wood, from which results may flow of great importance to the country at large.

In planning buildings to endure, it is required that the walls and partitions be made of ample thickness, of well-burnt brick, put together with the best of mortar, and that the floors, as far as practicable, be also made of brick, vaulted. Where this is not practicable, owing to the lateral thrust of the vaulting, then the floors should be of prepared timber laid together solid and coated with an inch of plastering beneath a wooden lath coated with the silicate of soda; the plastering largely composed of plaster or gypsum. The floor timbers should be attached to each other by spikes or dowels and lodged at the ends on brick ledges, corbelled out from a good depth below, and secured to the walls with iron anchors. The ends of the beams should be cut inclining, so that while of full length at lower edge they may be an inch distant from each wall at the top edge, and this space between the wall and the beam should be kept open for ventilation. The floors at or below the level of the street should always be vaulted with brick; for here it will not be difficult to secure sufficient buttressing to the arches, and here where the furnaces for heating are located there is the more need of protection. All flues for heating should be of ample size and lined with earthenware pipe. Stairways, usually of wood, afford means for the rapid spread of fire from the lower to the upper stories. Where practicable, these should be of brick and stone; and the stairways of each story should be provided with doors by which to isolate it from the other stairways. All partitions should be of brick, especially those about a stairway or an elevator. All shafts for elevators, or for light or air, should be provided with doors at each floor, in order to cut off when required all opportunity for a current of air. Wooden furring on walls is highly dangerous; when used it should be provided with bars of filling at proper intervals to prevent draft, and incidentally the circulation of vermin.

Partition walls of brick should, when possible, take the place of lines of posts and girders, that the apartments may be reduced in size; and the openings in the walls should be provided with doors and shutters by which to isolate the apartments.

If buildings were constructed in this manner, a fire would seldom extend beyond the apartment in which it originated.

To protect the interior, all wooden cornices, dormer-windows, and the like should be avoided. Roofs should be of slate or metal laid upon a good bed of cement concrete. The walls should be extended well above the roof and coped with stone or iron. The exterior walls should all be of good solid brickwork. If, however, there be iron posts, as those of a store front, these should be filled in solid with brick work of ample size to carry alone the weight of the upper walls.

Buildings of the character indicated could be erected at a cost not to exceed fifty per cent additional to that of the average city building, and in a city of such buildings damage by fire would be reduced to a minimum.

R. G. HATFIELD, *Architect.*

New York, 31 Pine St., Oct. 12, 1877.

MEMORIAL.

We are called upon to-day to express ourselves in reference to our late president,

MR. RICHARD UPJOHN,

who has finished his course on earth, and gone to his reward, in a nobler, higher sphere of being. We are sensible that no words of ours are required to enhance his fame. His works speak for him all over the land, and illustrate by graceful and enduring memorials the taste and genius that placed him in the foremost rank of our profession.

In the words of the *American Architect and Building News*, "It was not by brilliant and exceptional genius that the good fortune of Richard Upjohn was achieved, but by fidelity in the development of natural gifts, and by hard work judiciously bestowed."

It should also be remarked that to his artistic qualifications were added a stern integrity of character, a sound judgment, a generous sympathy with all who needed counsel and encouragement, and an unremitting and conscientious culture of the religious element that had been early implanted in his heart.

> "His life was gentle, and the elements
> So mixed in him, that Nature might stand up,
> And say to all the world, This was a man!"

Mr. Upjohn was born at Shaftesbury, Dorsetshire, England, on the 22d of January, 1802. After having enjoyed, in his early years, fair educational advantages, he was apprenticed to a builder and cabinet-maker. He early developed a taste for drawing and mathematics, and on obtaining his majority, he became a master in the trade, which he pursued until 1829. Being then in the twenty-eighth year of his age, he came to the United States and settled in New Bedford, Mass., where he followed his business in the day, and devoted his evenings to the instruction of a class in drawing. In 1833 he removed to Boston, and became assistant to the late Captain Paris, who was then the architect of the Boston Court House.

It was not long, however, before he commenced business on his own account. His first design, as an architect, was the fences and entrances to the Boston Common; and one of his earliest works was St. John's Church at Bangor, Maine.

With characteristic tenacity of purpose, he held out against difficulties and oppositions that were continually besetting him, until the year 1839, when he was called to New York to take charge of sundry alterations and enlargements proposed to be made to Trinity Church, but which were finally abandoned, and the site cleared with a view to the erection of a more magnificent structure.

In the preparation of the designs for the new edifice, the power and scope of the genius of Mr. Upjohn were first made apparent, and from that time the success of his professional career was assured.

Trinity Church was completed in the year 1846, and was then the noblest in conception and the purest in details of any ecclesiastical structure in this country, and notwithstanding the advances since made in architectural science and the improvements in professional education, it still holds its pre-eminent position with dignity and grace.

The reputation of Mr. Upjohn being established by his wonderful success in the design and construction of Trinity Church, he took the lead in ecclesiastical architecture, sustaining in his subsequent works the high standard which he had himself set up. We are unfortunately without a complete list of the ecclesiastical buildings he designed and erected, among which are the following: —

In the city of New York, the Church of Dr. Potts, on the corner of Tenth Street and University Place; the Church of the Ascension, on Fifth Avenue; that of the Holy Communion, on Sixth Avenue; the Church of the Nativity, on Avenue A near 6th Street; St. Thomas' Church, at the corner of Fifth Avenue and 53d Street; Trinity Chapel, on 25th Street, near Fifth Avenue; and Dr. Adams's Presbyterian Church, on Madison Square. In Brooklyn, L. I., are Christ and Grace Churches, and the Church of the Pilgrims; at New London, Ct., the Church of St. James; St Paul's, at Buffalo, N. Y.; St. Paul's, at Brookline, Mass.; St Stephen's and Grace Churches, at Providence, R. I.; the Presbyterian Memorial Church, at Springfield, Mass.; the Parish Church, at Portsmouth, R. I.; Grace Church, at Newark, N. J.; St. Thomas' at Taunton, Mass ; St. Mark's, at Mauch Chunk, Pa.; the Geneva Memorial Church, and St. Peter's Presbyterian Church, at Rochester, N. Y.; and Zion Church, at Rome, N. Y.

These works of Mr. Upjohn, embodying as they do a true mediæval spirit, worked a complete revolution in the processes of thought of those who had hitherto accepted as satisfactory the illiterate traditions that everywhere prevailed in reference to Gothic forms and the spirit of Gothic art. It is only those of us who can remember the manner of building called Gothic architecture fifty years ago, who can form any adequate idea of the change that "came over the spirit of our dreams," when the purer and more artistic forms of mediæval art began to be developed in the ecclesiastical structures of Richard Upjohn.

> "He dreamt not of a perishable home,
> Who thus could build."

The civic works of Mr. Upjohn are numerous, and show the same balance of mind that characterizes his ecclesiastical structures. He did not, however, draw upon the spirit of mediæval art for anything but his religious buildings. His course, in this particular, seems to indicate that he considered the Gothic form of art a thing consecrated to more serious uses. His domestic work was generally confined to the spirit of Italian Renaissance. His dwellings were sober and dignified, with no playful conceits, no eccentricities, or far-fetched oddities to amuse for a while, and then subside in aversion. All his works have grace and dignity, and their proportions and harmonies are ever growing upon all who take an interest in art.

Among his domestic buildings are the Lytchfield and Packer Houses at

Brooklyn; the house of Mr. J. H. Burch, at Chicago, Ill.; that of Mr. Edmund Dexter, at Cincinnati; of Mr. James A. Cowing, at Buffalo; of Mr. John S. Stone, at Bay Ridge, L. I.; of Mr. W. M. Stebbins, at Tarrytown; the Johnston House, at Flatbush, L. I.; the Forsyth House, at Kingston, N. Y.; that of Mr. H. B. McKean, at Philadelphia; those of Messrs. E. King, and others at Newport; that of Mr William Mason, at Taunton, Mass.; the Thayer houses in and near Boston, and those of Messrs. Seth Adams and Marshall Wood, at Providence, R. I, and Amos W. Smith at Portsmouth.

In all these works we have evidence of a master mind controlling conditions and circumstances so as to accomplish the most desirable results. Some of his domestic buildings are severely classical in treatment, and though well handled, are not, like his churches, greatly in advance of his time.

In the design of civic buildings Mr. Upjohn followed his natural predilections for correct and solid architecture, rather than for new and imaginative combinations. He designed and erected Trinity Building, and the Corn Exchange Bank in New York, a savings bank at Kingston, N. Y., a school building at Brooklyn, a hotel and a public school at Taunton, Mass., and a railroad station at Norton, Mass.; he also designed a chapel for Bowdoin College, and a library for Brown University.

Mr. Upjohn was opposed throughout his professional life to all architectural competitions which implied volunteer or unpaid labor, and he embraced every opportunity that offered to impress upon the members of the profession the importance of refusing to submit competitive designs, or to engage in any work for a less compensation than that provided for in the regular schedule of the Institute. He assumed his attitude on these questions with deliberation and self-denial. There are but two cases in which he was known to have deviated from his fixed principles in these particulars, by preparing designs with the knowledge that he was not the only architect who had been invited to do so, but these were exceptional.

The tone of his annual addresses, as president of the American Institute of Architects, is every way in accord with his own honorable and successful practice. The counsel he gives in these admirable documents, especially to the younger members of the profession, has had an influence in raising the social and moral standard of the Institute, and placing it in the advanced position it now occupies in the public estimation.

From its organization in 1857, to the year 1876, when he resigned the office on account of failing health, he was its only president. During all these years he was untiring in his efforts to establish good fellowship throughout the profession, to raise the standard of practice, and to promote the progress of our art.

The high standing he attained in his profession was recognized by his election as honorary member of the Royal Institute of British Architects, and also of the Institute of Portuguese Architects. These honorary distinctions indicate the esteem in which he was held by the profession abroad, and fitly supplement the high appreciation of his worth and genius manifested throughout the country of his adoption.

For many years Mr. Upjohn has been living at Garrison's-on-the-Hudson, where he had made for himself a picturesque cottage amid the magnificent scenery of the Hudson Highlands, where. as he grew older and more infirm, he settled down into a quiet country life.

The little Highland church, which he designed. and in which he was accustomed to worship, is a beautiful memorial of his taste, and a realization, on a limited scale, of the religious inspiration which always seemed to guide him in his church architecture.

During the last illness of Mr. Upjohn, which was not of long duration, he manifested a calm and intelligent devotion to the religion he professed, and with an unwavering trust on the " Strong Son of God," as he himself characteristically expressed it, he passed, on the 17th of August, 1878, from earth to

> " The Eternal City, built
> For the perfected spirits of the just."

THE PLUMBING IN A FIRST-CLASS BOSTON HOUSE.

[Read at the Twelfth Annual Convention of the American Institute of Architects by Mr. T. M. Clark, A. A. I. A.]

Two special characteristics of the sanitary condition of Boston have made a sensible impression on the plumbing work which is usual in the better class of houses in the city. A part of the town lies very low, so that the sewers which drain it are little above the level of low tides, and as the rise and fall of the tide is very great, the compression of the air in the sewers from this cause is considerable, and the long stagnation of their contents favors the generation of gas, so that the back pressure is often sufficient to force the house traps, and the utmost precaution of vent-pipes and valves is found necessary, to prevent the air in the houses from being contaminated, and the plumbers are glad to adopt the best modern devices for cleanliness and security.

Another habit which has always been very general in the city is that of supplying the house pipes from a tank in the attic, fed by a rising main from the street pressure and provided with a ball-cock. Perhaps the inequality of surface, which brought a considerable part of the houses so high, that in former times the water would flow into them only at night, when the consumption at the lower levels was reduced, may have made familiar a system which those who from experience had learned its superiority in the distribution of water through the house pipes have not been willing to abandon, although the necessity for it no longer exists.

In the application of these principles, the Boston plumbers practise certain refinements that are, so far as I know, peculiar to themselves. and which. it is no discredit to say, apply rather to the concealed working parts than to the ornamentation of stone-ware or plated work, in which the local taste is perhaps more sober than elsewhere. Some of their devices may not merit the full approval of a scientific engineer, but as attempts to meet certain wants they are at least interesting. An easy way of obtaining a connected idea of their mode of work, which can be compared with that practised in other localities, is to describe a typical house, one of many lately built or now building, mentioning particularly those details of workmanship which have most recently come into use.

Our house is liberally supplied with apparatus; three baths, five water-closets, six wash-bowls, three slop-sinks are provided, besides the usual soapstone sinks, wash-trays, pantry-sinks, etc. The bath-rooms are in the middle part of the house, but on opposite sides, those on one side opening from the front chambers, and those on the other from the rear, and a well on each side affords a dim light.

Beginning in the cellar, we find a four-inch soil-pipe descending on each side nearly to the floor, then changing to five-inch each runs along the wall to the rear of the building, where they join, and continue, still five-inch, through the cellar wall, and some distance beyond, to the earthen drain trap. A four-inch iron pipe running up independently inside the house, and opening above the roof, connects with the five-inch drain just at the cellar wall. This supplies fresh air to the bottom of the soil-pipe in the only way which would seem practicable in our climate. The English, with the same object of securing a circulation of air through the whole length of the soil-pipe, connect with it at the bottom a ventilated trap, opening at the ground level, outside the house wall. This satisfies them, but appears not to have succeeded very well here, and the plumbers, while accepting the principle, consider it necessary to carry up the inlet pipe where there will be no risk of cold air descending to freeze the trap, or of foul air issuing under the noses of the passers-by. The drain is made of iron for ten or twelve feet beyond the wall, on account of the danger from settlement of the ground, which in the new part of the city often breaks off earthen pipes close to the line of the building, and every second length is connected to the adjoining one with a Y-branch, the oblique arm of the Y being uppermost, with a round piece of sheet-lead cemented in, so that by cutting out the lead, access may be had to the drain every ten feet, for clearing out obstructions. The vertical soil-pipes run up in chases eight inches by eight inches, formed in the brickwork, and the space around them is built up with pieces of brick and cement. All the iron pipes are painted with red lead.

On the cellar ceiling run all the pipes which are required to go from one side of the house to the other, none being allowed to cross the floors above. On one side, the stack of pipes ascends through the butler's pantry, with a board casing; the opposite stack, which passes through the principal rooms, runs up from the cellar behind the furring of a chimney-breast, and access to the pipes is managed by an opening framed in the beams of the cellar ceiling, and a ladder, made by nailing cross-pieces to the inner side of the studding which forms the breast. In the kitchen and laundry all the pipes are exposed, and all consist of brass tubes. The cold-water tubes with their fittings are tinned inside, but those for hot water are plain, on the theory that the hot water, by its constant circulation through the cast-iron water front and over the galvanized bands of the boiler, acquires a taste which will always prevent its use in cooking, so that special precautions are not needed for it, while cold-water pipes should be protected whenever there is any possibility of water for drinking or cooking being drawn from them. As tubes are made only with the coating of tin on the outside as well as the inside, the plumber has taken the trouble to scrape off all the outer coating, to make them look like the others. The brass tubes are used for hot water throughout the building, but for cold water only where exposed, lead pipe taking their place elsewhere.

The wash-tray wastes are trapped with one six-inch round trap, into which the three waste-pipes are entered, all of them below the water-line to prevent circulation of air from one tray to another. In the stories above, a similar mode of trapping is followed; wash-bowls, pantry-sinks, and baths are fitted with round traps, four, five, or six inches, and the overflow and waste pipes are separately entered below the water level, so that the circulation of air down the waste and up through the overflow into the room, or in the reverse direction, bringing with it in either case the smell of the decomposing slime which lines the waste-pipe, is completely cut off. The round traps are suspended between the beams, so that the brass screw is flush with the floor, only the hexagonal projection for the wrench rising above the surface, and the overflow and waste pipes are carried down at the back of the space beneath the bowl, so as to leave practically the whole of this space available for a cupboard, without lessening the accessibility of pipes and trap.

The water-closets are of the pan species, to which all plumbers are so much attached, but they are the best of their kind. The inside of the receiver is enamelled, and even the pan is improved by having a round piece of porcelain, some four inches in diameter and thick enough to be in no danger of breaking, cemented into the bottom, so that when the pan is at rest, nothing but porcelain appears in the bowl. Each is supplied from a service cistern, with lever and cistern valve. A one and one half inch brass coupling is inserted in the top of the receiver, and to this is attached a ventilation pipe, carried out above the roof. A bent pipe, pierced with a number of holes, encircles the top of the bowl, communicating with another ventilation pipe, carried separately to the roof.

In addition to this, all the traps are provided with air-pipes, which extend to the top of the house. Of course, some of them join in the ascent, but they are carefully sorted, so that the evil communications of those from the fouler places may not corrupt the good manners of the more harmless ones. Thus, the vent-pipes from the closet traps on each side of the house are joined in one, but kept separate from any others. Another shaft is devoted exclusively to the ventilation of the closet bowls, and the receivers have also one for themselves. The slop-sink traps have a separate pipe as far as the upper story, where it joins that from the closet traps, while the air-pipes from baths and wash-bowls are joined and carried up in one. All these are duplicated, one set being required on each side of the house, and with the open mouths of the two soil-pipes.

and that which supplies air to the foot of the drain, we have thus eleven shafts projecting above the roof. This may seem an unreasonable number to an engineer, but our practical plumber by paying for them has borne witness to his sense of the necessity for them.

One other point may be mentioned to complete the description of this particular example of plumbing work. The house, like all others of its class in Boston, is supplied through the intervention of a tank in the attic, and in order to be able, at pleasure, to shut off the water from any part of the house. four separate pipes issue from the bottom of the tank, ramifying as they descend through the house into the smaller branches which supply the different apparatus. The usual mode of controlling the flow through these pipes is by stop-cocks close to the tank, but they are seldom used, and the ordinary ground faucets slowly corrode and become immovable. The compression cocks are better, but the course of the water through them, even when wide open, is very tortuous, and the supply at points below is less free on that account. In this case our plumber has solved the difficulty by putting on steam valves, of the kind known as the straight-way stop-valves, in which a solid gate of brass moves by the action of a screw directly across the bore of the pipe, and when opened leaves the water-way entirely free.

This is the kind of work which a first-rate Boston plumber, acting without any specification or directions from the architect, taking the job as sub-contractor under the builder, who troubles himself about the matter only so far as to require that the bids should be understood to be for good workmanship, thinks himself bound to put into the building. At half the cost, he could have completed his contract in a manner which would have passed inspection as good ordinary work, so that he has followed out his convictions of what was needful to a perfect job at his own expense. We have heard a good deal lately about the bad plumbers and their misdeeds; let us not forget to give the good ones, where we find them, such credit and encouragement as we may.

Passing from practical to experimental sanitary work, those who have constantly presented to them the problem of the efficient drainage of country houses, may take an interest in the details of an attempt to carry out the Moule system of subsoil irrigation, as described by Col. Waring in his papers in the *Atlantic Monthly*, and noticed by several other writers.

The house to which the system was applied stood at the upper side of a plot of about half an acre, sloping quite rapidly to the northwest. Both the owner and the architect had been interested in the descriptions of the system, and were desirous of trying it, and the sloping ground seemed to give a favorable opportunity, as affording space to lay the outlet pipes close to the surface, without any fear that the waste water could back into the house if they should be frozen or clogged, which seemed the chief danger. With the kind assistance of Col. Waring, the scheme was laid out as follows: Just outside the basement wall, an iron Field's flush-tank was sunk some four feet below the surface. Over the grating of this discharged the waste of kitchen and pantry sinks, wash-trays and bath. A wooden box, brought up to the surface, with a cover, gave access when required. The drainage of the wash-bowls was led away by a separate pipe, to lose itself in a trench filled with broken stone at another part of the plot, while the soil-pipe from the water-closets discharged into a separate drain, which joined that leading from the outlet of the flush-tank about twenty-five feet from the house. The two drains, one from the tank and the other from the soil-pipe, after joining, continued some twenty-five feet farther down the hill to a tight circular cesspool, five feet in diameter and five feet deep, of hard brick in cement, sunk so far as to bring the crown of the dome about one foot below the surface. The land inclined so much that the cover of the cesspool was below the outlet of the flush-tank, so that any accumulation of water in the pipe, caused by a stoppage beyond, would, by the time it reached the tank, lift the cover off the cesspool, and the subsequent additions would flow away harmlessly over the surface of the ground below, without the possibility of its backing up into the house. This seemed at the time a wise precaution, but experience shows that it is quite unnecessary. The brick cesspool as a part of the system was rendered essential by the introduction of the soil-pipe drainage, which could not enter the flush-tank, and yet required a place of storage, where solid matters or substances likely to choke the subsoil pipes might settle or gradually dissolve. The soil-pipe was without trap of any kind, and half a dozen holes drilled in the stone cover of the cesspool served to admit air to the whole length of the soil-pipe and drain. A four-inch outlet pipe was built into the lower side of the cesspool, about four feet below ground, and continued nearly level, with water-tight joints, obliquely down the hill, until the fall of the ground brought the pipe within sixteen to eighteen inches of the surface. Then the line was continued by a succession of Y-branches forming a curve, such as to give the pipe a grade of about one quarter of an inch to a foot, but keeping it everywhere at the same distance below ground. From the unoccupied branches of the Y's, lines of two-inch unglazed pipe and collar land drain were carried back, making an acute angle with the main line, and curving around the outline of the hill so as to describe almost a series of contour lines, except that the pipes were laid to a slight inclination, one inch to twenty-five feet, and the extreme ends of the lines were brought very near the surface, — within eight or nine inches. Three hundred feet were laid in this manner, in nine or ten parallel lines, the trenches filled in and the place sown with grass-seed.

The whole arrangement worked perfectly through the autumn and winter. In the spring, the ground was dug over for replanting, and advantage was taken of the opportunity to examine the pipes and see what condition they were in. By this time the water had begun to make its appearance through the ground at the ends of the lines of pipe. All the rows stopped close to a fence, and the open ends being near the surface, and in loose, newly graded soil, the liquid had found its way out, and had worn a channel, through which a little stream trickled away and disappeared in the grass on the other side of the fence. At its first appearance, where the ground was almost without vegetation, a certain amount of smell could be perceived, but where it ran among the grass there was nothing of the kind. The water from the pipes was rather milky, and wherever it rested for a time it left a blackish scum, but the quantity was very small in proportion to the volume of water. On exposing the lines of pipe, it was found that a similar scum had accumulated wherever there was any check to the flow. The lower end of the chain of Y's had been cemented tight, and these having been laid with considerable pitch, the lower portion formed a kind of pocket, and the liquid reaching the end was obliged to turn back on itself to get into the outlet pipes. This turning back of the current had led to a considerable deposit of sediment, so that the last two or three Y's were completely filled with black mud, which prevented the water from getting into the lines of outlet pipe which connected with them. In one or two places, also, the open jointed pipe had not been evenly laid, or had settled, and the water lingering in the depression had also thrown down a slime sufficient to partly fill the tube; but wherever the flow was unobstructed they were washed perfectly clean. The clogging of the soil which had been anticipated was found not to have taken place in the slightest degree. Whether the oxidizing action of the air so near the surface had destroyed the organic matter as fast as deposited, or the flush-tank and the settling cesspool had together been able to keep back the slime which so soon clogs the ordinary leaching cesspool, may be a question; but it is certain that the soil, which was a compact marl, retained hardly the slightest trace of the twenty thousand gallons or so of sewage which had been discharged through the pipes.

When the pipes were relaid, the lines were left open, to watch the absorption by the soil in the bottom of the trenches. The slight flow, which constantly trickled from the flush-tank, was taken up immediately, and the discharge of the whole tank by means of the siphon, which took place about twice a day, remained not more than five to ten minutes in the trenches before being entirely absorbed. In the relaying, additional trenches were made, and about one hundred and fifty feet more of pipe put down. The Y's were cleaned and the last one, instead of being closed, discharged directly into one of the new lines of pipe. The grade was rectified and the trenches inspected to see that the outflow from the joints was uniform throughout each line. The collars of the original pipes fitted very tightly, so that the flow through some of the joints was almost nothing; in relaying, the collars were for the most part omitted, and the new pipes were ordinary sole tile without collars. To guard against the bugbear of the pores of the ground becoming filled, as well as to save the pipe from displacement, a row of small stones was put on each side before covering in. The whole has since continued to work well.

Of the agricultural value of the system, it was impossible to judge, as the ground under which the pipes were laid was poor, and had just been rather thinly sown with grass, but that the liquid had some fertilizing properties was shown where it escaped from the surface and trickled through the fence. Here it lost itself in a patch of grass which reached an enormous growth, one root among many having sent up twelve stalks each over six feet in height.

The perfect practicability of this mode of drainage in so exposed a situation still needs to be tested by a winter more severe than the last, but wherever it can be applied, the advantage over the leaching cesspool seems very considerable. The cesspool, in all but the most open soils, is certain to get clogged before many months, and the cleaning out is as troublesome and costly as the cleaning and relaying of a whole system of pipes, and is horribly offensive, while the smell from an exposed row of pipes is almost nothing, and can be wholly subdued by a few handfuls of earth. The stoppage of the pipes if properly laid is probably impossible. It must be considered that the area of outlet in five hundred feet of pipe, laid one sixth of an inch apart, is five hundred square inches, or nearly one hundred times the capacity of the drain which supplies them, while the area of soil presented to the current, supposing the tiles surrounded by dense clay, so that the water could only creep along the sides of the pipes, would be three hundred and seventy-five square feet, or about six times that available in an ordinary cesspool, while a few stones along the sides of the pipes would double even that. Moreover, if a stoppage should take place in all the pipes, it would be extremely gradual, joint after joint being closed, and the taking up and relaying of five feet of pipe would again give an outlet equal to the inlet, while a cesspool chokes all at once, and the first intimation of trouble is given by finding ten to a hundred gallons, the amount of the emptying of a wash-tub, or a flood of surface-water from a heavy rain, poured out over the basement floor; and the whole annoyance and expense of a thorough cleaning must be endured before the drains can be used again, while only assiduous disinfecting will ever make sweet a cellar once soaked with sewage. As to the theoretical virtues of discharging the house-waste within reach of the air contained in the surface soil, it is only necessary to refer to any book on sanitary engineering; we have also to consider the convenience and the relative expense, as well as the probable defects, of the different methods which it is possible to employ, and a little relation of practical experience may be useful to many who hesitate to spend their clients' money on devices which they know only through the glowing descriptions of sanitary reformers.

THE RECIPROCAL DUTIES OF ARCHITECTS AND THEIR EMPLOYERS, ESPECIALLY IN RELATION TO PUBLIC BUILDINGS.

[Read before the New York Municipal Society, by A. J. Bloor, F. A. I. A., on Dec. 3, 1877, and presented Nov. 14, 1878, to the Twelfth Convention of the American Institute of Architects, by whom it was referred to the Committee on Publications.]

Mr. President and Gentlemen of the New York Municipal Society:—

I have been asked to prepare and read a paper "on the duty of architects as to economy and appropriateness in their designs, especially for public edifices, and as to the responsibility (in whom generally?) for the cost so generally being immeasurably beyond the estimates." In my answer, acknowledging the honor done me by the request, I said that if I complied with it, I should have to join in the theme the reciprocal duties of owners and building committee.

Let me say, in the first place, on the point of economy, that so far as my information goes, it is only in a very few cases of public buildings that the cost is largely beyond the estimates. It is with buildings as it is with people. The individual is lost in the crowd unless pre-eminent either for good or for bad. The million inhabitants of New York go about their daily business with little comment. But let one of that million, of any grade, commit a murder, or one of them, of prominent grade, be detected in any flagrant breach of a conventional law, and for nine days, more or less, the newspapers feed all the rest of that million with the scandal. Just so with the buildings of the community. The larger or smaller capitalists build their blocks of houses in the city, or their single houses in the country, and no one except those interested as disbursers or recipients or prospective occupants hears anything about them. They are built sometimes with, but oftener without, the intervention of an architect. When one is employed, I think it is very seldom that the charge of going beyond the estimates, except under the owner's orders, can, after investigation, fairly be brought against him. Few people in this community build more than one or two houses for their own occupancy during a lifetime; but while this one is building, it is the owner's hobby. Nothing is too good to incorporate into it. Self-importance and sentiment, all the feelings of the *paterfamilias*, the desire for the maximum of domestic comfort and of opportunity for the display of resources,—all are actively at work from the first line drawn on paper to the setting of the capstone; and I think it is, perhaps, more common for the architect to incur the displeasure of the owner, tacit or expressed, for attempting to control his inclination to lavishness, than for endeavoring to lead his employer into avoidable expense. When the day of reckoning comes the owner may find it a relief to his feelings to lay the blame for over-expenditure on another's shoulders. The payment of extra bills is not conducive to amiability or candor, and I think it is just at this stage that an owner is apt to wax eloquent over what he chooses to call the extravagance of architects. I doubt if, in one case out of ten, an owner will, after the settlement of bills is quite off his mind, have one word to say in relation to the cost being beyond the estimates, except so far as, by additions and changes, he has himself gone voluntarily beyond the original estimate.

Public buildings of course attract greater attention than private ones, and the facilities for increasing expenditure, whether lawfully or unlawfully, are also greatly in excess. Many reasons conspire to this. For one thing, there is often long delay between the tendering of estimates and the commencement of the work, and the market prices of material and labor — for they generally fluctuate together — may have greatly increased in the interim. The work will then progress on an enhanced scale of prices, which is not nearly so apt to be sedulously kept before the eyes of the tax-paying community as the first low estimates were. Hence a great newspaper hubbub, when, on being called to foot the bills, the tax-payers discover the difference between their amounts and the original estimates. Again: in the case of a private building the architect has but one employer. In the case of public buildings of importance he is quite likely to have a dozen. Each man on the building committee has his own pet theory, and often his own personal interests, more or less direct, to advance,— his local interests, his social interests, his family interests, perhaps his direct pecuniary interests; the last, it may be, in a perfectly lawful way from a commercial, if not from a public-spirited point of view, and perhaps not, as investigation sometimes proves. And I may be allowed to remark here that I know of no instance where legal investigation has resulted in fastening a charge of corruption on the architects of any of our public buildings. Whatever may be thought of the design or lack of design of the new County Court House in this city, it has yet to be proved — and there has been much litigation and airing of facts in the matter — that in the case of that greatest scandal in the way of building operations in this or probably any other country, the architect was at all responsible for its cost being so immensely out of proportion to any fair estimate of its value as a pile of building materials. Tweed's recent testimony — whatever that may be worth — includes building contractors on that structure in its damaging statements, but not, so far as I have observed, the architect. The recent investigation into the affairs of the new Capitol at Albany casts suspicion on commissioners and senators and superintendents, but not on any architect. I speak only of legal culpability, and will not exceed my limits by entering on the question of how far an architect deserves to be criticised who draws a commission on costs he cannot help knowing are immensely above fair market rates; or who, without allowing the question of fitness in selection to interfere, makes secret arrangements by which stone from a quarry, or iron from a foundry, in which he has an interest, is used; or who adds to greed a morbid egotism that blinds his eyes to the merits of any work but his own, and leads him to foist his cuckoo eggs in another's nest, at no matter what cost to artistic congruity or to the public credit, or who leads, or endeavors to lead his employers, who may be simply the trustees of other people's contributions, a dance of disbursement at their cost and his profit from one insufficient building for public uses to another, of equally fine promise and equally disappointing result, probably. The charges of dishonesty against the architects of the Jefferson Market Court House were not sustained after legal investigation. All that was proved was that a competent subordinate in the architect's office had permission to receive, on his own account, a moderate compensation for furnishing bills of quantities to the mechanics, — a most useful and valuable practice, which prevails in Europe, in building operations, and, as many experts think, is much needed in this country.

It has been asked whether architects have not a moral responsibility on the side of the public, as apart from their own personal emoluments and professional ambition, when they have any real share (which, however, I think the manipulations of the financial and political managers of public buildings seldom leave to them) in shaping the expenditure of public money. I think they *are* morally bound to use whatever influence they can command to dissuade building committees from wasting the money collected for purposes of public beneficence from the tax-payers, on showy façades to asylums and prisons, at the expense of interior space and convenience, sanitary or other; and consequently at the expense of the health and comfort of the poor and unfortunate in their community, whose wants might be cared for with the money thus used. But if reform is really wanted in this matter, there is more need to attack the rivalry and ostentation of commissioners and building committees than their architects. The latter are, in fact, only the hired servants of the former, and the mass of them closely resemble men of all other professions and vocations in preferring for themselves and their dependants bread, and as much butter as they can scrape on it, to creating enmity among their employers, by attempting to lecture or reform them. It does not take a man of much observation or insight, architect or other, to find out that swift and early reward in a worldly sense (no matter what success a higher course may command to those who remember the Italian proverb that "everything comes to those who know how to wait") will be, not according to his faithfulness to what is right, but according to his pliancy to egotism and greed, and the effrontery and impudence, the trickery and falsehood, which are born of them. For faithfulness is a virtue which, though he may be glad to employ it in the person of others for his own interests, is at heart greatly despised by the average *soi-disant* self-made man (though he is generally — yet with many admirable exceptions — not more than quarter made in reality), whose success has been mainly achieved by, it is true, the virtues of energy, enterprise, economy, and foresight, but also too often by persistent domineering selfishness and the deliberate repression of the finer instincts, and who, of course, carries his vices as well as his virtues into his relations with the current forces of the society he dominates. The architect of an important public building has generally enough to do without turning reformer and philanthropist, in protecting the interests of himself and those dependent upon him from the rapacity or ignorance, or both combined, of those who are masters of the situation. For there is quite likely to be a ring behind himself and the honest men on the building commission, a ring which is, in popular phrase, "on the make," and he will be very apt to lose pay for his own work, and reimbursements for his employees' work already performed and in prospective, if he in any way interferes in its machinations Indeed, like the rest of the community, he may have no knowledge of them that would have any standing in a court of law, no matter what his moral certainty or his suspicions may be, till some internal quarrel results in public exposure.

And even if no ring for ulterior purposes exists, the various members of a building committee, though they may be ever so honest and well meaning; though they may be shining lights of the church, the forum, or the exchange; though they may be travelled men of large general culture, — even of scientific and artistic culture, — hardly ever have any available knowledge, for practical purposes, of the theory or technics of the building art. The unhappy thing, both for themselves and for the architects, is that they conceive, if they have skimmed over the three or the five "orders," — whichever number suits them the better, — and have paid their mechanics for putting up a stereotyped house of their own, or have simply read the weekly quotations of the prices of brick and lumber, that they hereby become adepts on every point that exercises the powers of the architect, in his complicated and difficult field. Of course, the ideas of such persons as to what is due the architect are apt to be very hazy. Amateurs for the nonce are very apt to see no difference, not only in resultant value, but in cost of production, between the tokens of their own irresponsible surface work, and those of the practitioner's years of general, and weeks or months of special study and application. After a little observation of the routine of an architect's office, the more sensible of them soon learn to place a juster estimate on the value of his skill and the cost of rendering it on paper for the use of the employer and mechanic. But there are some men who seem never to get quite over a misty feeling that an architect is a sort of cross between a mason and a sketcher, and that his time and labor are not gaugeable for practical and remunerative purposes as other men's are. Yet the fact is, so far as instinct and capability go, that except in the exercise over their drawing-boards of more or less of the creative faculty, — a faculty not greatly exercised by the multitude, — architects are remarkably like other men, while in their current necessities they are absolutely like them, from him who eats the best of bread and the sweetest of butter by plying his trade of kingcraft, down to the *chiffonnier* who scrapes his crust out of the ash-barrel. Like most well-reared people, they are much addicted to eating and drinking. As a rule, architects don't smoke poor tobacco if they can get good cigars. They live in, as well as build, houses. They wear clothes, and their tailors are not called on to leave orifices for wings as well as for limbs. Their pinions are not so well developed but they can brace them down with their ordinary sartorial appliances. Being taught that there is neither marrying nor giving in marriage in heaven, most of them — not being

Newtons, or Pascals, or Turners — consider it their duty to society to get married here, and ever afterward take a vivid interest in the market rates for children's shoes and school-bills.

There is really no reason why architects, as a body, should be cut off from the practical sympathies of the rest of mankind on the score of genius so exceptional as to be able to dispense with the advantages of association with safe and easy-going mediocrity. Carlyle states as an ethnological fact that Great Britain is peopled with 40,000,000 inhabitants, — mostly fools; and it is well known that the amiable sage of Chelsea has, at least, no better opinion of their 40,000,000 cisatlantic cousins. No doubt he classes the architects with the rest of the inhabitants, while Ruskin's latest dictum — and it may be accepted as his latest, at least till the next number of *Fors Clavigera* appears — about the profession is that it comprises the most sordid and stupid of mankind. Yet the average architect is as apt to see the entire length of his nose as other average men. When hard pressed by his needs or his ambition, he is as apt to know how to use suppression, detraction, or equivocation, when he does not employ something still more positive, in the case of a real or assumed rival, or of one who cannot be used as a tool, quite as well as the next average man, and he has been known to evince his adaptability for all the uses of average citizenship, by allowing the wool to be well pulled over his eyes, and by following the track of the best-fed leaders in a way that would honor the agile allurements of the most unctuous bell-wether of a Tammany Convention.

In regard to "the duty of architects as to appropriateness in their designs," several things are to be observed. In the first place, the authorities are by no means agreed that a structure should express its purpose by its exterior. Some critics insist that a house of worship should look like a church, and a house of imprisonment like a jail, and I am free to say that I am of that opinion; but others, equally entitled to consideration, contend that it would be just as reasonable to expect the tailor to label the merchant and the lawyer, the manufacturer and the teacher, by the cut of his coat. Many, perhaps most, competent architects and architectural amateurs would exclusively assign the so-called Gothic varieties of style to ecclesiastical structures, classic forms to public buildings for secular use, Renaissance and the various subsequent combinations of it with other motives to domestic uses. The temperate and equipoised Ruskin, on the other hand, would visit with condign punishment the designers of any example of the building art, from St. Peter's to a dog-kennel, rendered in lines outside of historical Gothic; and has placed on record his aspirations for the destruction by fire of the city of New York and the new portion of Edinburgh, because they are not architecturally conceived to his liking. A Quaker thinks that a barn to worship in is more conducive to spiritual gain than Westminster Abbey. A few sods, with now and then a simple flat stone laid on them, is all the sepulchre allotted to the vast majority of the sons and daughters of men, but the Shah Jehan thought the Taj Mahal — the superb structure that in Fergusson's opinion embraces the most beautiful and precious style of ornament ever adopted in architecture —

none too good to mark the resting-place of his deceased wife. Who, then, is to be arbiter on the question of appropriateness in design?

I hope I shall not be considered a mere spokesman for my own cloth when I say that it seems to me not unreasonable that an architect should be allowed to be, on the whole, a better judge than the laity of how far the æsthetics at least of his design are appropriate to its uses. Reverting to the Jefferson Market Court House recently built in this city, — the alleged inappropriateness and extravagance of which opened in this society, as I understand, the discussion to which I am in my small way now contributing, — I confess that I do not see, for my own part, why the public money is not well expended in such a building. The community can well afford to pay handsomely for such a fine tower and such a judicious appropriation of a clever English design for the façades as the Court House affords, simply to look at it, as a connoisseur looks at the pictures in his gallery. In the one case, however, thousands of people — the poorest as well as the richest, posterity as well as contemporaries — have, or will have, the daily privilege of enjoying a beautiful work of art, and they do this without reference to its uses; while in the other, the collector simply gratifies the æsthetical side of his own nature, or, at most, occasionally divides his pleasure, and that sometimes quite as much from a feeling of ostentation as from a higher one, with a few friends and acquaintance. But dismissing the subject in its æsthetical aspect, the question will bear the closest examination on the most utilitarian grounds. Is it too much to say that the architecture of Italy, erected hundreds of years ago, has, combined with its other art treasures, by attracting sight-seers from all climes, proved one of the best investments ever made on the planet, has formed a permanent capital which has put bread into the mouths of millions of its people? Moreover, for contemporary purposes, a fine building greatly increases the value of the adjoining property. Buildings erected subsequently are more prone to be made to conform, as far as possible, to its standard. The value of a lot depends on the value and uses of the contiguous buildings. Ground and house rent advance and the public treasury correspondingly gains by the proportionate increase of taxation (which is of course no excuse for a community submitting to the self-pocketed extortions of a Tweed ring). Real-estate capitalists understand this. Neighborhoods are manufactured, as it were, under very large capitalists, by simply taking the initiative with a handsome church or a block of fine houses. The Jefferson Market Court House has probably, so far as real-estate capitalists are concerned, excited the indignation only of those who have no property in its vicinity.

Reverting now to the question of excess of cost beyond estimate, in the case of public buildings, one other and most important element remains to be considered, among those I have not specified, and which it would exceed my limits and your patience to examine. I mean the political element. Changes of administration, the rivalries of political parties, and the conflict for spoil among the managers of those parties and their hangers-on, enter very largely, sometimes overwhelmingly, into the account, where important structures are concerned, *e. g.*, the New York Court House.

I have so far endeavored to cover, from my point of view, the question presented me, as to the duties and responsibilities of architects, and I have hinted at the reciprocal duties of their employers; but if you asked me to speak to you — as I must assume you did — not simply to confirm your own impressions, and possibly prejudices, but to let you know the result of a specialist's observations and reflections in matters pertaining to his specialty, I shall be obliged to dwell a little longer on the duties and responsibilities of those who employ architects; which I have the less hesitation in doing as the more or less specific statement of my conclusions will carry with it suggestions — whatever they may be worth — as to remedies for evils which both architects and their employers doubtless agree should be remedied or ameliorated.

It seems to me then that, particularly in the case of costly public buildings, much good would be accomplished by the legal protection of architects, so far as possible, from the encroachments on their province of incompetent practitioners. This would not only insure better buildings, but it would make the selection — such selection being of course a primary necessity — of competent practitioners a much easier matter than now for the trustees of the public. Another desideratum is the choice of men of liberal education, as well as of prominence in business or official circles, for building commissioners, and in the invariable inclusion among them of architects of high standing, having no personal interest except as commissioners in the building scheme under consideration. But perhaps above all, an ameliorative project, as relating to important public structures, should include the removal of governmental building administration from what is called practical politics; in a word, it should include what is needed at the root of all public service in this country, — national, state, and municipal, — civil service reform.

If the question be raised whether radical civil service reform is possible under the present political conditions of the community, I am obviously carried beyond the duty assigned me in this place. Without, therefore, discussing that question, it seems safe to say that civil service reform should — alike for the protection of the public, of owners and trustees, and of architects and their artistic and mechanical coadjutors — include the whole building service of the community, whether it be in public or in private hands. It ought, I should say, to include the best system that can be devised for the supervision of the homes and other resorts — religious, administrative, educational, correctional, recreational — of the citizens of the whole country. I do not mean simply that the public administration of the building service should be infused with the scientific and artistic elements which belong to the profession of architecture, and not left to the merely and very incommensurate mechanical tendencies which at present so largely prevail in it; or that it should be brought up to its maximum possibilities as regards the architectural beauty and harmony which prevail in the principal cities of Europe, with results so satisfactory alike to the resident and to the traveller. This is indeed highly desirable, and there is, it seems to me, no reason why this country should not follow up its triumphs — in the taming of the wilderness, in the founding of a government "of the people by the people for the people," in the unprecedented prosperity and education of the masses, in its wonderful results as regards invention and commerce — by rivalling in turn the achievements of the art epochs of the Old World in architecture, as in painting and sculpture. But public administration has another mission as regards the practical phases and every-day purposes of the building art. In proportion to its facilities for acquiring popular suffrages are its duties to the masses, not only in an executive way, but in the prevention of disaster. Take, for instance, our own place of residence. During the quadrennial period of 1873–76, eighty-seven millions of dollars were expended in the city of New York in new buildings and alterations of old ones. Its building department has jurisdiction over thirty-two square miles of territory, including the Westchester district lately annexed. The duty of the department is, so far as its means permit, obviously not only to insure the safe construction of buildings in process of erection, but to prevent accidents to the life, limbs, and property of the city's million of inhabitants from the decay or other defective conditions of one hundred and five thousand existing buildings (in round numbers), including six hundred and fifty churches, schools, and hospitals, and one hundred and twenty-five places of amusement. Now, leaving out of consideration the constant surveillance required for this wilderness of existing structures, surely an annual expenditure of over twenty millions for new ones should be guided by the best designs, and the construction involved in them executed under the best supervision that can be had. The real-estate capitalist who provides ill-contrived interiors for his tenants to live in should be held to some account, and he who obtrudes a badly designed façade on the perpetual gaze of the public does it an enduring wrong. The fever bred by the overcrowded tenement-house spreads to the millionnaire's mansion, and public morals and morality alike depend — to an extent which is only beginning to be realized, through the labors of philanthropists and statisticians — on the cleanliness, comfort, and health of the masses. Certain philanthropic associations in England have wisely adopted as a motto the English architect Godwin's phrase, "As the homes, so the people." If the phrase has an important meaning in the monarchies of the Old World, where the people — that is, as there understood, the masses — have so little influence on government, how much more significant is it in a democratic republic, where the votes of citizens, forced by the grinding poverty induced by birth, drink, laziness, dearth of employment, or other misfortune, to live in pigsties, are bought up, for a glass of rum, by men of low aims and unscrupulous methods, but eligible as rulers, and to whose birthrights, habits, and prejudices those of the voters are often but little inferior! Yet is it not true that by far the larger portion of the structures of this community are, in their arrangement for — or perhaps I should say against — light, heat, ventilation, drainage, privacy, and decency, left to the haphazard of incompetence, or the deliberate omissions caused by the parsimony of owners, the rapacity of officials, or the trade rivalries of workmen? I shall revert to this point presently in its relations to conflagrations.

Outside of this continent there is not a country in Christendom where the government of the cities and towns does not include the supervision of their buildings by professional experts, under the most precise and minute regulations as to material and manner of building. Every structure standing, or in process of erection, in London and its suburbs, except a few public ones, exempted by name, is under the control of one of a corps of architects, called district surveyors, while heavy penalties attach to any violation of the laws as enforced by these building experts. On the Continent, somewhat similar systems everywhere prevail, though not always so perfect. The Continental governments, however, generally far surpass that of England in their appreciation of and provisions for a most necessary element in any thorough system of home administration, namely, the mutual responsibilities of governments and the architects to whom are so largely, though it may be indirectly, intrusted the lives and health of the various members of their respective communities. The authorities of those old countries recognize much more readily than those of ours that if experts are held to public responsibilities, they should in turn be protected from whatever impediments may arise from the ignorance or unscrupulousness of non-experts. But what do we find here? Not a single architect throughout the country on whom it has been obligatory, as in Germany, to earn, after long and careful tuition and a rigid examination, a diploma guaranteeing to the building public his competency, according to its terms, either as a full architect or as an assistant of some specific grade. The functions of the Board of Health in this city as to the hygiene of buildings are supposed to be mandatory, but it is understood that "practical politics" render much of its efforts almost nugatory.

Then as to immunity from fire, what do we discover? Mr. Hatfield, a Fellow of the American Institute of Architects, has lately compiled from the records and reports of the fire underwriters some valuable statistics, showing the heavy losses that are incurred by the country from poor construction and inadequate inspection of buildings. Excluding the great fires of Chicago and Boston, — which swept away two hundred million dollars' worth of property, — not less than one hundred millions per annum have been destroyed by fire within the territory of the United States and Canada, during the last ten years; while during the last quarter of a century the losses have aggregated to an amount which would have sufficed to render all the buildings fire-proof against a general conflagration I will not detain you by going into the figures by which this may be proved; but asking you to take it for granted, I wish to invite your attention to its bearing on the future Let us assume fifty years as the duration of fire-proof buildings, — not that from a constructional point of view they might not last for hundreds of years, but the constant and rapid changes in the commercial and social world lead to the as constant destruction of buildings. We will then be in a position to affirm that if we accept say, two thousand millions as destroyed by fire during the last quarter of a century (all or most of which would have been saved if the money had, in the first place, been put into fire-proof buildings, under proper governmental restrictions and inspection), and if we make allowance for increase in the number of buildings during the next fifty years, proportioned to the probable fourfold increase in population during the same period, we are perhaps safe in predicting that, unless the community insists on a general system of fire-proofing, not less than sixteen thousand millions of dollars will fall a sacrifice to the Moloch of fire in the United States during the next half-century.

Moreover, let us reflect on the loss of life that has accrued from the prevalent negligence in building operations. The recent holocausts at the Brooklyn Theatre and the St. Louis Hotel will at once occur to you. Of theatres alone, considerably over a hundred have been burnt down in this country within the last twenty-five years. I have encountered no statistics giving the loss of life directly from conflagration, but it must have been very large; while fatal illness among the poor, resulting from the consequent want of shelter and loss of property, must also have been very great. Now, there is no excuse whatever for such a state of things, though the reasons for it are very plain. Where thorough building laws are enforced, as in most of the great cities of Europe, fires are of the rarest occurrence. The communists of Paris, in 1870, destroyed comparatively little by fire, not because they did not try to burn down the houses, but because the houses, the modern ones at least, would not burn. A letter of Powers, the sculptor, was extensively published a few years ago, in which he stated that during his residence of over thirty years in Florence, not a single building had ever been burnt down. In this country, however, or at least in this State, there is a large class of people who seem to think that houses should be built, not so substantially that a fire department would be almost unnecessary, but with express reference to giving employment to firemen. At least there was no opposition on the part of the community generally (though the association representing the architects, and that representing the building mechanics of the city of New York, jointly protested against it before the Legislature) to a bill transferring the functions of the Building Department — one of the principal duties of which is to see that buildings are proof against fire — to the fire department, the only ostensible duty of which is to put out fires and prevent the spread of conflagrations.

Is it too uncharitable to suggest that the root of all the trouble implied in the questions pertaining to my specialty, which you have proposed to me,— as in most other questions, more or less important, now agitating the better portion of society, — is this: The forces of our community in this generation are employed not nearly enough with public-spirited aims, and far too much in the interest of personal greed and self-aggrandizement? Art, as applied in daily life to the enhancement of what would otherwise have merely utilitarian uses, and as distinct from art the uses of which end measurably or absolutely in itself, like statuary and painting, and especially music, the art of architecture, as applied to our dwellings and other resorts, with all that is comprised in them, is not exempt from this sordid *quasi* law, any more than science, literature, politics, charity, religion itself. Commercial ambition and social rivalry, almost unchecked, for practical purposes, by any counterpoising deference to spiritual or moral standards, or even to any sentiment for permanent rank and title, – not a very high sentiment *per se*, but less sordid than the worship of money and plutocracy, — or for the birth that implies transmitted capacity for high training (though the lowest professional jockey will sedulously study and proclaim the pedigree of his horse), have so thoroughly permeated the community, as a whole, that that plain-spoken, and as a rule, judicial-minded organ of the press, the *Nation*, notwithstanding its reputation among many good people for arrogance and cynicism, is probably right in saying that universal corruption prevails in affairs. Is not a political party apparently on the rise that bases itself on what would virtually be national repudiation? National, State, and municipal administrations, to say nothing of commercial and professional combinations, often of vast power and importance, in behalf of private interests, are very generally — may we not say in most instances? — "run" on the same principles, in large measure, that gambling-houses are. Legal practitioners become the merest jackals to sharpers. Associations of all kinds dissolve amid the recriminative shouts of their members, while the unwholesome aroma that accompanies pipe-laying and curbstone operations pervades the atmosphere. No charity — even if it is linked with the agonies of civil war and with a death struggle for national salvation — is so much ennobled by its sources or its aims that it is not likely to be finally turned to the account of a few wire-pullers, greedy of lucre or a little local evanescent fame. Historical societies follow in the track, crook the pregnant hinges of the knee to the dictum of some time-server, stultify their very name and existence, belie contemporary gratitude, and commit the unpardonable sin against posterity by the utter ignoring or falsification of, or the *suppressio veri* in some important episode of current history. The pulpit of our churches becomes an auction-block for the sale of more or less eligible seats, from which to witness the weekly sensational performance, and the incumbent is in reality awarded his salary and parsonage more as the social and socialistic figure-head of ambitious *parvenus* and as the *succedáneum*, for pious folk, of the buskined tragedian, — or better still, of the socked comedian, — than as the dispenser of the Bread of Life. Courts of justice and wide-circulating newspapers are bought up, body and soul, by Tweeds, Fisks, and their tribe, who take care that for the finely painted jumping-jacks, whose wooden limbs will dance when the string is pulled, there shall be gold added to their colors, and for the faithful workers who will not respond, there shall be returned, unhonored, the unswelled claim for services faithfully rendered, or the "clammy touch" of the would-be assassin. It is true that one would-be assassin has gone to his account, through the violence he practised and worked, and one head wire-puller is in jail. But the latter enjoys his reputation, and has his little jokes as "the great witness" in an unimpeachable court, and says truly that he neither commenced nor ended in his community the plan commended by the freebooter, Rob Roy, —

> "The robber's simple plan, —
> That he should take who has the power,
> And he should keep who can."

The newspapers seem to think it very sad and shocking that a smaller witness should glory, in the same court, over his own robberies, and boldly proclaim, amid the laughter and applause of his audience, that there is not a man in the room who would not, with the same opportunities, do as he had done. But what is really sad is that what he said was probably true of most of the people in the room. And shall we not say outside of it also, considering that the smaller witness receives an "ovation" from his local public when he returns home from the witness-stand? Is it to be wondered at, then, if under-paid architects, suffering from the ignorance or selfishness, or both combined, of building committees, suffering from the effects of the mismanaged competitive system, as commonly practised in public building work, — whatever project for a new structure that is submitted to them being probably organized as a bonanza for corrupt politicians and their tools, and the "prize plans" "adopted" before most of the competitors have put pencil to paper, — is it to be wondered at if architects, particularly those who have been engaged in public works, and have acquired an insight into ways that are dark and tricks that are not in vain for putting money in one's pocket, should be tempted beyond the moral strength of at least a few of them, to follow in the wake of their employers? Is it to be wondered at if occasionally architects, cut off from the restraining influences of inter-professional association, should take their turn as hoodwinkers and strive their best — even if they don't succeed — to lead employers, whose hands hold the public purse-strings, from one stage to another of alteration or addition, of tearing down or building up (but all involving expenditure, and proportional remuneration)? Is it to be wondered at if they strike hands with some under-paid and not over-scrupulous office-holder (for almost all responsible officials are under-paid in this country, while a great army of irresponsible ones are over-paid in being paid at all), and join in the game of "addition, division, and silence"? The way to reform such architects, if any such have been or should be developed, is to reform their employers; and their employers will be what they are so long as the public has no higher standard of action than that supplied by the current laws of trade. I say the *current* laws of trade. If trade were pursued in the spirit in which the just-appointed minister to the court of St. James says he has, during a long life of business, practised it, there would be little need for any community to seek for higher governing principles. But we have only to read the annals of Wall Street, or the records of the mercantile or carrying or insurance service of any of our great business centres, we have only to glance over the first newspaper we pick up, to learn on what principles our business affairs are mainly carried on. We know that the inspired observer of old noted that then as now, "the buyer sayeth it is nought, and straightway goeth and boasteth." The future of commerce must lengthen and increase with the duration of the human race, for there is nothing that has deeper roots in human nature than the elements of trade. But if a great community is to be built up on it, it must be passed under the yoke of the moral law. As long as trade is the dominant force in a community, the special practice which provides homes and other resorts for that community, must, like that of all other ministrations to it, share in the characteristics of that trade. Professional practice of all kinds — the architect's no less than the lawyer's or clergyman's — will be colored by it, whether it is pursued in a public-spirited or in a selfish, in a fair or in an unfair, spirit. The stream cannot rise higher than the source, and must more or less partake of its impurities.

THE LEGAL RESPONSIBILITIES OF ARCHITECTS.

[A paper read at the Twelfth Convention of the American Institute of Architects, by Mr. T. M. Clark, A. A. I. A.]

THERE is a great deal of confusion in the public mind as to the limitations of the responsibility of those who are employed to direct construction, and it is not impossible that architects themselves do something to increase the confusion, not so much from ignorance of what the law requires of them as from the readiness with which some, in their eagerness for employment, bind themselves to terms of excessive harshness, and perhaps, also, the ambition of some to claim an authority over clients and contractors more absolute than is always necessary or desirable.

There is a popular idea that the architect is somehow responsible, not only for his own work, but for that of all the contractors for a building. He is supposed to be in some way capable of watching at once all the workmen employed in the structure through the whole of their working hours, so that the mechanic who has been astute enough to conceal his bad mortar and rotten timber during the periodical visits of superintendence, passes for having only yielded to the impulses of human nature, while the architect, who failed to find him out, is denounced as incompetent. Especially is the final certificate supposed to confer a sort of plenary absolution on the contractor who has managed to obtain it, and who thinks himself entitled to keep the profits, whether honest or dishonest, which he may have been able to secure by means of it, on the pretence that the architect's approval supersedes for him the faithful execution of his contract.

But if builders find it convenient to claim such preposterous authority for the acts of the architect, which are profitable to them, the public, on the other hand, seem to find difficulty in holding their agents, in matters of construction, to even moderate accountability, and their attempts to do so result in some cases in gross injustice to their professional adviser, and in others in such extraordinary contracts with architects as that which the Indiana State House commissioners have succeeded in getting one of them to accept.

It would be much to the advantage of the profession and the public if their mutual duties and responsibilities were better understood, and a reference to cases in which the law on such subjects has been established may be interesting, even if very incomplete.

The general rule of law in all cases of employment of professional advice is that the expert shall be bound to use in discharging his trust an ordinary amount of care and diligence, together with an average degree of skill and knowledge of his business. The highest degree of skill is not expected of him; but neither can he satisfy justice, as has been claimed, with such an amount of intelligence as may have been shown by great masters under unfavorable circumstances. What is required of him is a continued exercise of the best skill which, with ordinary talents and opportunities, he could be expected to attain.

Perhaps in practice want of care and diligence is more frequently imputed to architects than want of skill, and courts are stricter in interpreting the law in that respect. In an English case, an architect, sued for negligence, replied that he found that his instructions were disregarded by the builder, with the approval of the owner, and thinking it useless to waste his time in frequent visits, he had only been to see the work about once a month afterwards. That seems not unnatural, at least; but the court did not find it justifiable, and judgment was given against him.

In general it may be remarked that juries' notions of faithful supervision differ materially from what architects are apt to understand by "superintendence," and he who has a difficult or dangerous piece of construction or alteration to carry out will consult his own interest, in view of the risk of accident, by conducting himself so that want of diligence at least may not be imputed to him.

As to want of due care and skill, there seems to be some variation in the practice of different countries.

The French Code says, Sect. 1792: "If the edifice built at an agreed price perish in whole or in part by faults in its construction, even by defect in its foundation, the architect and the builder are jointly responsible therefor for ten years."

This is the law of France, and, in substance, of England and the United States. The French jurists make some further distinctions. It has been decided that the architect is solely responsible for damage or failure in a building which has been strictly carried out in accordance with his plans and under his directions, if the workmanship and materials were not defective; and this decision seems to overrule a claim which has been made, that the builder should be supposed to know as much of his own business as the architect, and unless he protested against a faulty design he should share in the responsibility for it.

Another decision extends the responsibility of the architect to all cases of damage which may result from a violation or ignorance on his part of the rules of the art which he professes, or of the laws which it is incumbent on him to know, such as those relating to party walls, or ancient lights, or the police or municipal regulations of the locality in which he builds; and it has been repeatedly held that the architect could not free himself from this responsibility, even by alleging the consent or the positive orders of the owner.

As to the architect's accountability for the bad quality of work done under his supervision, there is no obscurity whatever. The law says: "If the architect is charged with the surveillance of the work of the contractor, he can be held responsible for all the consequences of any negligence in his performance of his duty"; so, whether it may be that the plan has not been faithfully followed, and the building is consequently defective, or the contractor has furnished bad materials or workmanship, those who suffer inconvenience from any of these deficiencies have a cause of action against the architect, subject to the limitation of the code, which says (Art. 2270) that "after ten years, architects and contractors are discharged from the guarantee of work furnished or directed by them in accordance with an agreement as to price," and, of course, provided they can show that the damage or inconvenience could have been prevented by the exercise of due skill and care on the architect's part.

This seems a hard doctrine, considering that the architect has no interest in permitting the use of bad materials, and can wholly prevent it only by extreme watchfulness, if at all, while the builder controls every detail of material and workmanship, and if those furnished are defective it must be with his knowledge and collusion, and with intent to defraud the owner, and if he succeeds in his fraud the whole profit is his; but there is no doubt that it is the law in France and Great Britain, as well as this country, and a man who suffers from defective work in his house or other building, which might have been detected or prevented by what the court may consider reasonable care on the part of the architect, can recover damages from him. In the English and American practice, it would seem that the architect is compelled to make good the whole loss if the owner chooses to require it, while the French courts seem to exercise a discretion in apportioning the indemnity between those to whose fault the loss is due. Thus, in a case where a bridge was washed away by a flood, the municipality sued the engineer to compel him to repair the loss, but the Court decided that, although the flood was an unusual occurrence, answering in part to what our books term an "act of God," still it was within the reasonable skill that the law expected of the engineer to provide against such occurrences, and his share of the responsibility was estimated at one fourth, and he was condemned to pay one fourth the damage.

In another case a town built a hall, and six years after its completion the stone began to flake off. The municipality sued the architect and builder jointly. It was in evidence that some of the stones were placed off their natural bed; and although it appeared that it was difficult to distinguish the beds in that particular stone, the Court held that the architect ought to have been able to do so, and that it was one of the rules of his art not to allow such misplacing, and he was obliged to pay one half the damages claimed.

One of the French commentators asserts the existence of an important rule, — that if the superintending architect has given the proper direction for the execution of the work, and has, before they are actually in place, pointed out defects in the materials on hand, he escapes liability. If he has not, he is liable, but not as a principal. The principal is the direct cause of the damage, that is, the contractor or workman who by fraud or negligence has badly executed the work which was confided to him. He is the immediate cause of the damage, and should furnish the reparation. The negligence of the architect is only secondary and accessory, and he should only be held as a subsidiary, — as a bondsman in case of insolvency of his principal.

There seems to be some comfort in this, but without referring to the decisions on which the opinion was founded, it is impossible to tell how much authority it has. Certainly there appears to be no trace of such a principle in the English or American decisions, so that it is wisest for us to continue to think that a general supervision only is not enough to satisfy the law, and that in case of accident the courts will hold us, as the French say, *solidaires* with the builder in respect of damages.

An illustration of the American practice is found in the case of Newman *v.* Fowler, decided in New Jersey in 1874.

A house after completion proves defective; the report of the case does not say in what respect, but it is found that there was want of care and skill on the part both of the architect and of the contractor. On the principle that when several persons are concerned in inflicting injury upon a man, any one of them is liable for the whole damage, and that the person wronged may choose which he will compel to pay the indemnity, the owner sued the architect for the entire damage. The jury was charged that where the negligence of the contractor was such as to be discoverable by the exercise of reasonable care and skill on the part of the architect, the architect and the builder were alike responsible; for the effects of negligence of the builder beyond this measure, he alone was responsible. In this case the negligence or unskilfulness of the architect being admitted, his sameness of accountability with the builder was a necessary consequence, and the owner had a right, if he chose, to obtain from him the full damages, and judgment was given accordingly.

A point in this case is interesting. The owner had kept back a part of the contract price from the builder, on account of defects not specially described. The defendant's counsel claimed that by so doing he had already obtained indemnity from the builder, and could not demand further damages from the architect. The judge's reply was, that if the builder had sued the owner for the balance of the contract money, and the defence had been that it was retained on account of the same defects for which the present action was brought, and the defence had prevailed. it would have barred the present action against the architect, since the owner was not entitled to obtain damages twice over, once from the contractor and again from the architect; but in fact the builder has not sued for his money, and there was no evidence that the owner might not have retained it on account of other defects than those for which he was suing the architect, so that the question of the retained balance was still open and undecided, and could not be considered in the present action.

Another case, decided in Missouri in 1876, gives an idea of the care which the law considers to be required of architects. A building was in process of construction, and iron columns and girders had been set to carry some portion of it. By defect, probably of the foundation, two of the columns settled after the weight was brought upon them. The architect proposed to raise them with the girders resting upon them, apparently so that they might be underpinned. It was in evidence that one of the contractors who furnished the iron-work, hearing the architect propose to apply jack-screws under the caps of the columns, advised him not to do so, as he did not think the casting strong enough; but the owners took the architect's view, and on his recommendation employed a professional building mover for the work. It appeared that there was some stipulation that this man should work under the direction of the architect; if it had not been for that, the judge's opinion was that the architect would not have been liable for the improper management of the raising which was alleged by some of the witnesses. On the application of the jack-screws the cap of one column broke at the corner, and the flange of the compound wrought-iron girder resting on it bent, allowing the girder to fall. bringing down a wall with it, and killing a workman employed in the building, whose widow sued the architect for compensation for her loss. The architect himself was not in the building at the time, but knew and approved of the method adopted to effect the raising. The judge charged the jury that if they found the disaster was due to an improper method employed for effecting the raising. or because of inadequate supports for the screws or unskilful application of them to the columns, while the work was under control of the architect, he must be held to have shown negligence in business which he undertook, and if he failed to show the care and skill which, having undertaken it, the law imposed upon him, he was liable for the damage resulting from his negligence. Some of the testimony went to show that the design of the girder was bad, and that the columns were weak and badly cast; and the jury were charged also that if they found that defective iron-work was the origin of the accident, and that this was designed by the architect in an unskilful manner, or was defective by means of bad material or workmanship, which could have been discovered by the defendant, in this case also he was guilty of a negligence which rendered him liable for injury resulting from it. The judge thought that the absence of the architect at a time when so critical an operation was going on was in itself a failure to show the care required of him, and thought also that he was guilty of neglect in not having the strength of the caps of the columns tested before subjecting them to so severe a strain; and the jury taking a similar view, the defendant was obliged to pay the amount claimed, $5,000. The Court, in this case, was of opinion that the owners of the building were liable, together with the architect, but it is not very evident why; and in an English case of manslaughter from the falling of a building. the owner, who proved that he had given orders for good and substantial work, but knew nothing of construction himself, and had not controlled the details of the execution, was discharged.

The professional man must not forget that the damage for which he may render himself liable by remissness in duty extends beyond loss by the deficiencies in the construction. A distinguished architect in London was accused of negligence in failing to prepare plans for a certain alteration with due rapidity, and the proprietor, who let the rooms in the building to lodgers, claimed the profits which he would have derived from his house if the work had been finished without delay, and the court decided that he was entitled to recover them.

It would seem, therefore, that there is no want of law to hold the architect to his duty to his employer; but if the courts set up a high standard of professional diligence and skill, it must be acknowledged that their requirements are, on the whole, reasonable and just to all the parties, and the practitioner, conscious of having done his work with faithfulness and skill, can appeal with confidence to a jury against the oppression of an ignorant or avaricious client. Every step that is made toward a clearer definition of our duties helps us to a recognition of our rights; and if the public should learn to hold us generally to a stricter accountability and a higher standard of skill, those who desire the advancement of the profession will rejoice, not only in the necessity for higher attainment, but in the increased respect and easier relations with the world which recognized acquirement and responsibility will give.

But there are certain branches of an architect's duties towards others than his clients, which are by no means so well defined. An important case, decided in the House of Lords after long and costly litigation, raises a very interesting point. A contractor named Thorn was invited to estimate on plans and specifications for rebuilding the Blackfriars Bridge. His bid was accepted, and a contract, of which the specification formed a part, was signed. The engineer had designed to construct the bridge piers by means of iron caissons, sunk in the river, and filled with masonry; and the plans and specifications were drawn to that effect. In execution, the caissons proved too weak to sustain the water pressure, with the force of the current, and the upper part had to be removed, and the work finished by the slow and costly process of building only when low tides permitted. When the bridge was finished, the contractor sued the mayor and corporation for damages for the insufficiency of the plans and specifications, alleging that, by offering them for estimates, the corporation virtually guaranteed that the bridge could be built in accordance with them. The corporation replied that there was no guarantee, express or implied; that while they placed confidence in their engineer, Mr. James Cubitt, they did not pretend to warrant his work; that the contractors knew as much of him as the corporation did; and if they had wished, they could have had an engineer of their own examine the plans, and pronounce as to their practicability; and if they then wished to withdraw their proposal, they might have done so. And the unanimous opinion of the judges was that this defence was a good one, and judgment was rendered for the corporation.

According to the Lord Chancellor, the same principle should apply in every case where a man employed an architect to prepare plans and specification, and invited estimates upon them.

It being thus settled that the first party to a contract does not guarantee the plans and specifications which form a part of the contract, it is of the highest importance to determine whether the expert who drew them could be understood to have guaranteed them. In the case of the bridge, the engineer was dead before the action was brought, unfortunately for his professional brethren, who could have derived much instruction from seeing the result of a suit brought against him; and there appear to be few or no recorded cases of the kind, unless in French practice.

Another subject which gives trouble to a conscientious architect is the proper adjustment of his duties between the builder and the owner. In case of dispute between the parties to the contract, he is made the judge by universal custom; and even in court, the architect's position as umpire between owner and contractor is so well recognized that his testimony is generally the most important part of the evidence. Yet how does such a position agree with the rule of law that a man can act only in behalf of one person at a time? The owner engages him, and bears alone the cost of his employment. Is he not then solely the agent of his employer? And if so, how can he act as umpire between his principal and the opposing party?

That this is a serious question, every one in practice has occasion to know. Cases happen every day in which a contract open for estimates is awarded at a price which the architect, who has the other bids as well as his own judgment to guide him, knows to be less than the value of the work. Is it his duty, as agent of his employer, to accept the proposal which he sees to have been based on some misunderstanding or error, and set himself to drawing up a contract so framed as to protect his principal from loss, in case of the bankruptcy of the builder, which he knows to be inevitable? Or has he a right to constrain his principal to accept a bid at a fair price, or to call the attention of the incautious bidder to the probability of an error in his estimate? If he takes advantage of the ignorance or carelessness of the builder, to the benefit of his employer, has not the builder a ground of action against him? And if in pity for an honest mechanic who has made a mistake in adding up a column of figures, or who, not being very expert in reading manuscript, has been unable to spell out all the words in the specification, he has given him a hint of his misunderstanding, has not the owner, who is thereby obliged to pay a larger sum than, with skilful management, he otherwise would have needed to spend, a right to accuse him of unfaithfulness to his trust, and to claim damage from him?

Such questions have a serious bearing, not only on the professional conduct, but on the peace of mind of a conscientious practitioner; and any discussion or citation of cases which have been decided that may tend to a general understanding and uniform practice in similar matters is one of the many things of which the profession is in great need.

ARCHITECTURAL DESIGN.

[By C. A. Cummings, F. A. I. A. Read before the Twelfth Convention of the American Institute of Architects.]

THE worst faults of our architectural design appear to me to lie at present mostly in the direction of unrestrained or undisciplined ambition, which leads us in the first place to tell all we know, and sometimes more, at a single effort, as if we never expected another opportunity; and secondly to strive to produce, at all hazards, something startling and piquant, forgetting that the design, once executed, is to outlive all first impressions, and that what startles one to-day may disgust him to-morrow. Repose is contemned, and in its place we find the buildings, even of our educated architects, characterized too often by a fidgety and over-conscious display of knowledge, which might, under a stricter rule, have produced designs, if less striking at a first view, more admirable at every other.

For the conditions under which our profession is practised to-day are wholly different from those which prevailed twenty, or even ten years ago. The mental equipment and furnishing with which the young architect now starts forth on his career, resulting partly from the extraordinary multiplication of books and photographs, and partly from the admirable course of instruction offered by a few well-organized schools of architecture and architectural drawing, joined to a singular revival, if, indeed, it should not rather be called a new birth, of enthusiasm for this art in a thousand bright young fellows all over the country, offer a very different spectacle from the undirected studies and the rather languid and solitary beginnings which the elders of the profession have to look back upon. The young architect of to-day has only himself to blame if he has not the great examples of all styles and ages at his fingers' ends, as well as in his portfolios and scrap-books.

His danger arises, not from want of technical knowledge, but from intemperance and disorder in the use of it.

Another cause, which, as long as it exists, must prevent us from realizing the best results from our increasing knowledge, is the lightness and fickleness of our tastes, and their independence of fixed principles. This leads us to follow the prevailing fashion of the day abroad, — to design this year after the French Renaissance, the next in the English Gothic, the next again in the Queen Anne, so called. The performances, more or less striking, of European, especially of English artists, are promptly reported to us every week in the various journals, and we are as easily thrown off our balance by any audacious defiance of the plain rules of common-sense or the requirements of common convenience as by a real achievement of art.

The French would say this is the natural and necessary result of the absence of an academic standard; and it is certain that there is something imposing in their steadfast adherence to a national style, and their thorough and trained performance in it.

This is something impossible to us, and I am by no means sure that in the long run more is not lost than gained by it, even in France; but it would seem as if some mean might be discovered between a restraint so close as this and the wild license of our practice.

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